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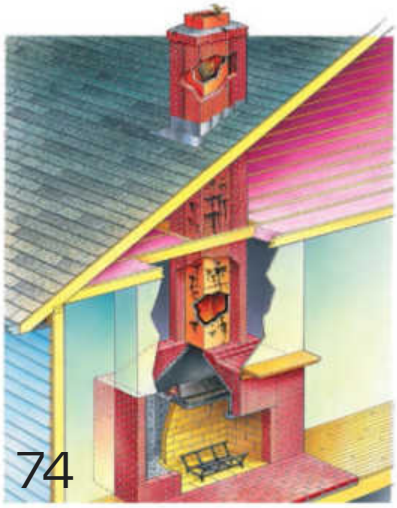

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STUFF we love

BY MARK PETERSEN editors@thefamilyhandyman.com

Add a USB charger in a snap

In this electronic age of ours, there seems to be at least one device being charged on every single counter and end table in the house. It's getting difficult to find an unoccupied outlet for our antiquated blenders and desk lamps.

Here's a cool gadget that can help. It's an outlet cover plate with a built-in USB charger, and it's as easy to install as a regular cover plate. You just shut down the power, unscrew the old plate and screw on the new one. No receptacle replacement required! The USB port gets its power from two prongs that contact the screws on the sides of the receptacle.

The cover plates come in white, light almond and ivory. One SnapPower USB Charger costs $20, or get a five-pack for $85. They're available at snappower.com.

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Ultimate garage door opener

My garage door opener finally gave up the ghost, but it survived almost 30 years and three teenage boys! I bought another Chamberlain and got a few more bells and whistles this time. The HD950WF model I chose has a hefty 1-1/4-hp motor and a battery backup, which is great because I rely solely on the garage door to get into the house. I'm not even sure where my house keys are, so I'd be in a pickle if we lost power.

The door starts out slowly, picks up speed, and then slows down before reaching the top or bottom. That, in conjunction with the belt drive, makes it super quiet. I really love that I can use my smartphone to close the door from anywhere, which comes in handy at bedtime when my wife is convinced the door was left open and wants me to go double-check. I picked up my Chamberlain for $268 at The Home Depot.

Mark Petersen, Associate Editor

WOLVERINE

DIY WORK WEAR

High-tech work boots

Work at a place that requires steel-toe boots? Then listen up. Wolverine just introduced a new boot that's much more comfortable but still offers solid impact protection. CarbonMAX boots have a protective cap composed of millions of tiny carbon nanotubes that are combined in a honeycomb pattern. The result is steel-like impact protection with much less weight and thickness. A lighter and thinner cap translates to a more comfortable boot. Prices range from $155 to $200 at wolverine.com.

Traveling doorbell

If you're in the market for a new doorbell, and even if you're not, check out the Honeywell Wireless Doorbell Kit. It has six high-quality chimes to choose from. The volume is adjustable, and more than one doorbell and button can be used together.

But what we love most is the fact that it can be lifted from the wall mount and brought with you into your shop, out in the backyard or wherever. So if you're waiting on a pizza delivery or the cable guy, you don't have to stay chained up inside the house. It has a 225-ft. range and a flashing icon to alert you in case you're working with headphones. Get one at Lowe's for $45.

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Longer-running batteries

Unless you've been watching closely, you probably haven't noticed that the run-time of cordless tools keeps creeping up. There are two reasons: First, advances in technology now allow individual battery cells to be monitored, and adjustments can be made in how they charge and discharge. This has allowed manufacturers to pack more power into batteries of the same size. For example, Bosch just came out with a 2.5-ah (amp hour) 12-volt battery to fit subcompact drills and other tools. That's a 25 percent improvement from the 2.0 ah, which was already tops in its class. Called the BAT415, it costs about $49 online.

Second, brushless motors are able to draw the appropriate power based on the task at hand, so batteries don't drain as fast. Brushless motors also reduce the power lost to heat and friction. You'll pay more for brushless motors and the higher amp-hours, but you may no longer need a large 20-volt drill to get the job done, and a smaller tool will cost you less money.

Travis Larson, Senior Editor

PRO GEAR

Innovative tread design

I recently had the chance to try out the new Cooper Discoverer STT PRO light truck tires off-roading up to the top of Grand Mesa in Grand Junction, CO…what a blast! The Discoverer tire incorporates some impressive tread designs, like mud scoops and dimples that pack mud into the tread voids and then immediately eject it as the tire rolls forward. In winter, the scoops and dimples pack in snow and keep it in the void—because snow-on-snow provides more traction than rubber-on-snow. The tread blocks have tapered sides and stone ejection pads to reduce stone retention.

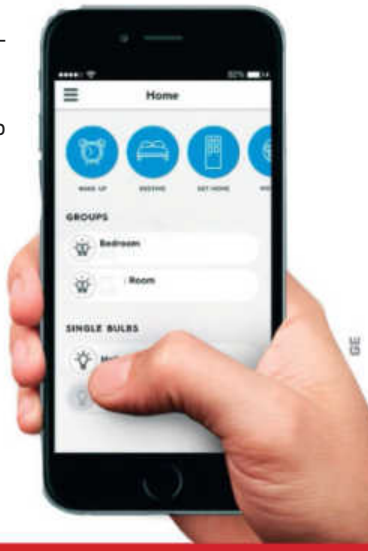
When I found myself hub-deep in mud ruts, I simply turned the wheel to the right and the sidewall "side biter cleats" dug me right out. The aggressive treads produced a little rumble at highway speeds but way less than other off-road tires. If you're in the trades and drive your truck on and around construction sites or on back-country roads, this tire is a real contender. Check it out at coopertire.com.

Rick Muscoplat, Contributing Editor

Smarter smart bulbs

GE has a new line of LED lightbulbs, simply called "C," that can be directly controlled with a smartphone or tablet via Bluetooth; no central hub necessary. There are two types of bulbs in the "C" line: The "C Life" is an all-purpose light perfect for the kitchen, living room or office. The "C Sleep" bulb has been designed to support the body's natural circadian rhythms, which can help you sleep more soundly. It emits a traditional soft light for the day; a warm, calming light before bedtime; and a crisp, energizing light in the morning. Who couldn't use a better night's sleep?

Using an app, the lights can be dimmed and set to a timer as a group or individually. When run for three hours a day, the bulbs should last 20 years! GE has launched a new website to market this product directly to consumers. A starter set that includes two "C Life" bulbs and two "C Sleep" bulbs sells for $50 and will be available Jan./Feb. '16 at CbyGE.com.



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BY JASON WHITE editors@thefamilyhandyman.com

Detect leaks

before they become disasters!

Things go wrong with plumbing systems. It just happens. And it doesn't matter where you live or how old your house is. A pipe can freeze and burst. A toilet can overflow. You might unknowingly puncture a pipe with a nail during a remodeling project. Or your water heater could let go and send a raging river flowing right through your home's living space. Scared yet?

Sooner or later, you're going to have a plumbing failure—maybe big, maybe small—but the key is to catch it before it causes catastrophic damage to your home. Think we're being alarmist? Damage caused by plumbing failures costs homeowners and insurance companies billions of dollars every year. Here are some high-tech solutions that will alert you when a leak is just getting started so you can deal with it ASAP.

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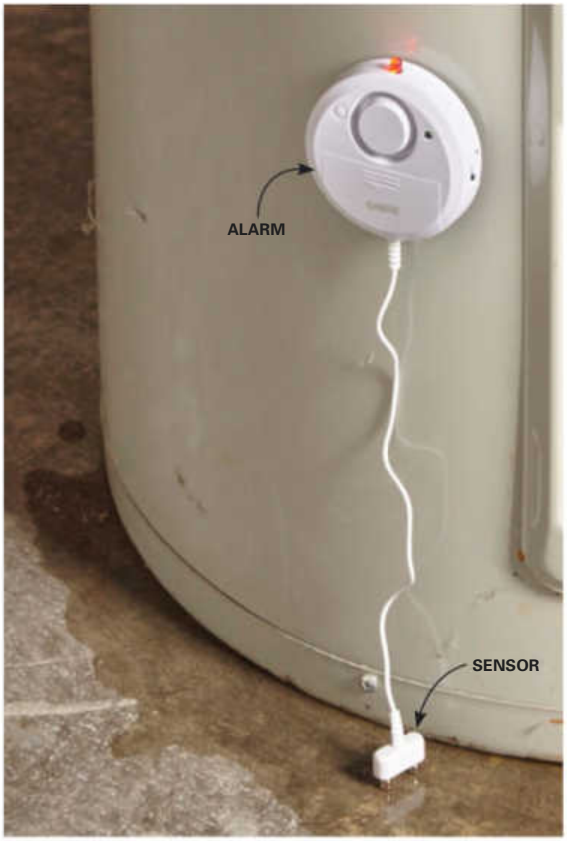
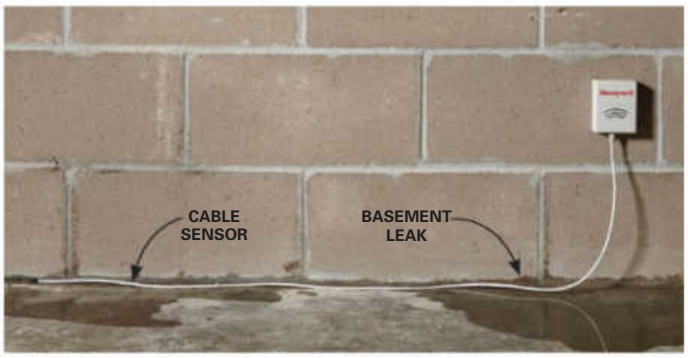


LEAK ALARMS

From a price standpoint, battery-powered water leak alarms are pretty hard to beat. They're available at home centers for $10 to $30. Sensors are placed on the floor next to plumbing fixtures and appliances like washing machines and water heaters. When the sensors detect even the tiniest bit of water, the alarm puts out an ear-splitting scream to announce a leak. You can also set one on your basement floor to let you know if water is seeping in from outside or if your sump pump has stopped working. They work great, but they're effective only if you're home to hear the alarm and turn off the water. And don't forget to change the batteries!



HIGH-TECH LEAK ALERTS

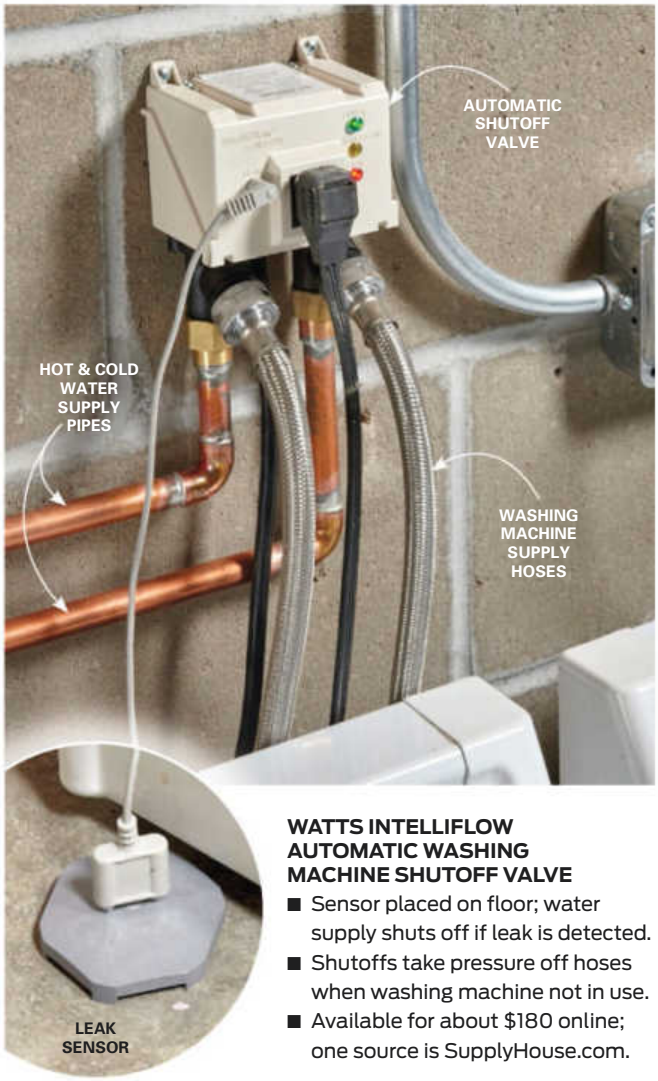
A step up from simple leak alarms is a leak detector that sends you alerts via the Internet. The system shown here is made by Insteon. It consists of a hub that you connect to your home's Internet modem. Wireless leak sensors, available as accessories, run on batteries and send radio signals to the Insteon hub whenever a leak is detected. The hub then sends an alert to your smartphone or computer. Prices start at $80 for the hub, and leak sensors cost $35 each. Additional "smart home" type accessories are available for use with the hub and are sold separately. While this is a great leak detection system for the money, you'll still have to run home (or call somebody with access to your house) to shut the water off if a leak occurs. Available online at insteon.com.

SINGLE-POINT SHUTOFF SYSTEMS

For better leak and flood protection, especially if you can't be home all the time, consider a "single-point" leak detection and automatic shutoff system. This type of device gets plugged into an electrical outlet and has a sensor that you place on the floor or inside an appliance pan. An electric shutoff valve turns off the water to appliances like washing machines whenever leaks are detected (especially helpful if your washing machine is upstairs where even a small leak can do extreme damage to the rooms below). Similar shutoff systems are available for water heaters, dishwashers and the like.

FLOODMASTER WATER HEATER AUTOMATIC SHUTOFF SYSTEM

- Sounds alarm and shuts off water supply when leak is detected.
- Accessory available that cuts off electricity to power vents on gas-fired water heaters.
- Can be connected to a home alarm system.
- Available online for about $215.



WATTS INTELLIFLOW AUTOMATIC WASHING MACHINE SHUTOFF VALVE

- Sensor placed on floor; water supply shuts off if leak is detected.
- Shutoffs take pressure off hoses when washing machine not in use.
- Available for about $180 online; one source is SupplyHouse.com.

SOMETIMES LOW-TECH IS THE BEST TECH

A great way to prevent leaks and floods is to regularly do a visual check of your plumbing system. Inspect pipes, fittings, supply hoses, shutoff valves and all water-using appliances for signs of corrosion or leaking. Fix small problems before they become big ones. And if you're going out of town for an extended period of time, shut off the water main (or well pump). For more tips on keeping your home's plumbing system shipshape, visit familyhandyman.com.

WHOLE-HOUSE SHUTOFF SYSTEMS

For the ultimate in water leak detection and flood prevention, consider a whole-house automatic shutoff system like this one. Wireless sensors placed around the house tell it when there's a leak or if a pipe has frozen, and a motorized valve shuts off water to the house. The WaterCop has been around for a few years, but the company now offers a Wi-Fi module that sends alerts to your smartphone or computer when there's a problem. A complete system with leak and freeze sensors, a Wi-Fi module and automatic shutoff valve costs about $900. And depending on how brave you are, you might need to hire a plumber to install it on your home's water main.

WATERCOP

BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Old smoke detectors cost lives

Every year people die because their smoke detectors didn't go off during a fire. That's usually because the batteries were dead (or had been removed to stop false alarms) or the detector was past its useful life or was located where occupants couldn't hear the alarm. This article will tell you how to check your detectors and replace them if necessary. We'll also help you understand the latest technology—which has improved dramatically in recent years—so you can choose detectors that best protect your home and family.

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA • TECHNICAL ILLUSTRATION FRANK ROHRBACH III

Do your present detectors work?

It's really simple to test your smoke detectors to make sure they're working. Just press the test button and the alarm should sound. If it's a battery-powered alarm and doesn't sound off, change the battery and retest it. If it's a hardwired unit and doesn't work, replace it immediately. If they do sound off, check the date on the label so you'll know when to schedule replacements.

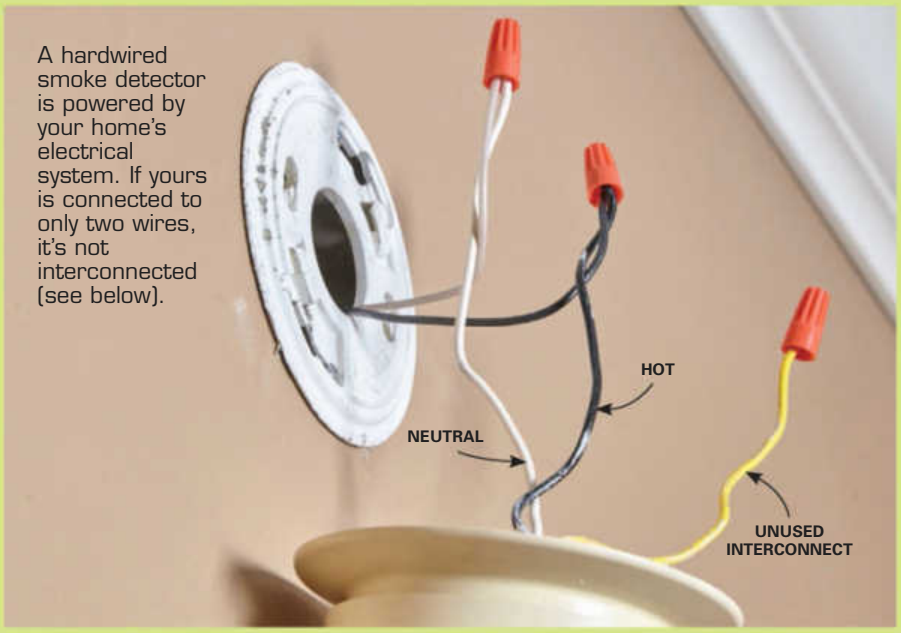
Smoke detectors are good for only 10 years. Some detectors let you know they're due for replacement with an end-of-life chirping sound. But others provide no warning at all—they simply die in silence, leaving you totally unprotected. If yours doesn't have a "replace by" sticker on the outside, rotate the body of the detector and detach it from its base. Then look for a date on the inside label or embossed in the plastic. If the detector is 10 years old or more, or yours doesn't have a date code, replace it now, even if it passed the button test.

TWO THINGS TO CHECK BEFORE YOU BUY REPLACEMENTS

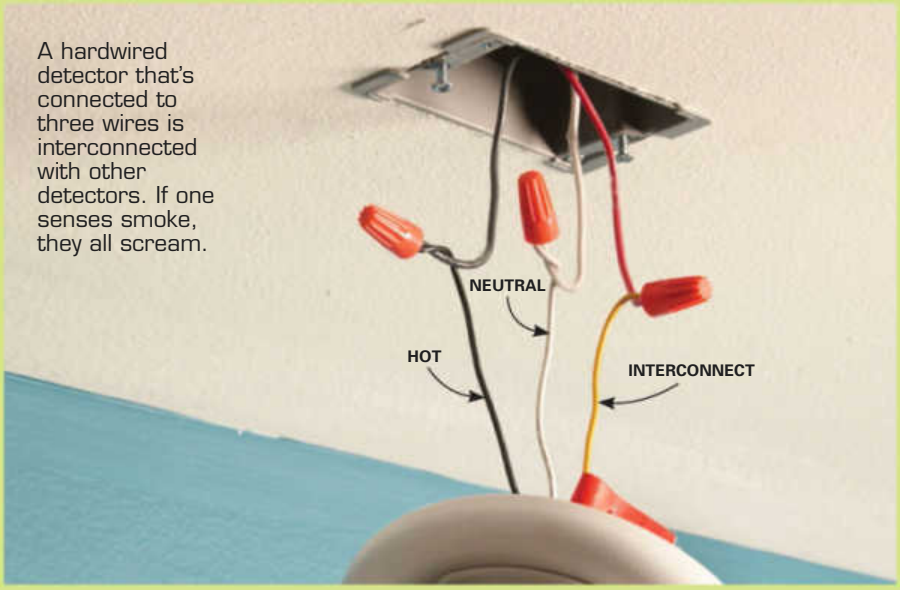
1. Are your detectors hardwired?
Rotate the detector body to release it from its base and pull it away from the wall. If you see wires, it's a hardwired detector and must be replaced with another hardwired unit—never replace a hardwired detector with a battery-powered detector.

2. Are your detectors interconnected?
Hardwired interconnected smoke detectors all sound at the same time, even if only one detector senses a fire. You can tell if they're interconnected by counting the number of wires in the detector's electrical box. If you have an older home (pre-1989) with hardwired detectors, chances are yours aren't interconnected. Confirm that by counting the number of wires connected inside the electrical box (**top photo**). Starting in 1989, building codes required all hardwired smoke detectors to interconnect. Interconnected hardwired detectors connect to three wires inside the electrical box (**bottom photo**). Knowing whether yours are interconnected or not will help you buy the right replacement units.

Continued on p. 21



A hardwired smoke detector is powered by your home's electrical system. If yours is connected to only two wires, it's not interconnected (see below).



A hardwired detector that's connected to three wires is interconnected with other detectors. If one senses smoke, they all scream.

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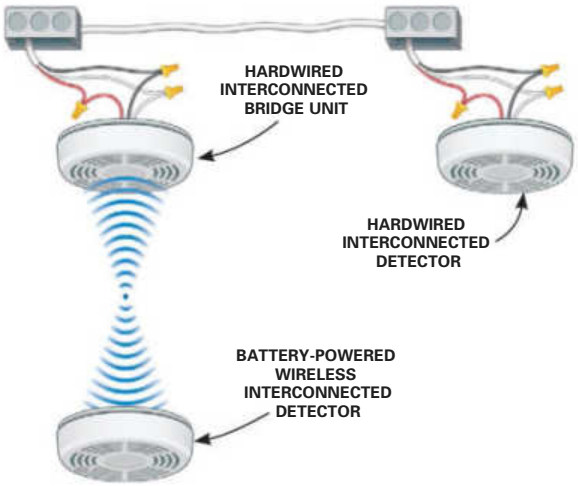
Get interconnected without wires

Hardwired and battery-powered wireless interconnected detectors communicate with one another via radio frequency (RF) signaling (not your home's Wi-Fi). So you can retrofit your existing hardwired non-interconnected detectors with wireless interconnected units (such as the Kidde No. RF-SM-ACDC; $55 at homedepot.com) and even add new wireless detectors to build a safer fire detection system, all without running any new wires.

If your home already has hardwired interconnected detectors and you want to add more battery-powered detectors, replace one of the hardwired interconnected detectors with a bridge unit. One example is the First Alert No. SA520B, $55 (photoelectric only), from homedepot.com. Then install battery-powered wireless interconnected detectors (such as the First Alert SA 501CN2-3ST; $85 for a two-pack at firstalert.com/store and other retailers). If you have any non-interconnected battery-powered detectors, replace them with the newer battery-powered wireless interconnected style.

A bridge unit lets you add interconnected detectors without wiring



Dual-sensor technology—the best choice for bedrooms

Almost 90 percent of all homes are outfitted with an ionization-type smoke detector. Ionization detectors respond best to fast-moving, flaming fires and are cheaper than photoelectric units. But photoelectric detectors respond faster to slow, smoldering fires. Since you never know what type of fire you'll encounter, all fire experts now recommend installing both sensing technologies on each level in your home and in all sleeping areas.

Dual sensor (ionization and photoelectric) detectors cost about $50 each and work great for basement and main floor hallway applications or where you don't want to mount multiple detectors on your walls or ceilings. However, for bedrooms and hallways outside bedrooms, many experts recommend installing two multifeatured detectors: a photoelectric detector with battery backup and an escape light and a second unit with an ionization and carbon monoxide (CO) sensor. That setup provides both types of fire detection, along with battery backup, CO protection and a light to help guide you through darkness and smoke.

For kitchen and hallway locations near bath areas, stick with photoelectric detectors only. They can handle steam and cooking smoke without triggering false alarms.

Talking alarms tell you where the fire is

Some new models allow you to program the location of each detector. So if one of the programmed detectors senses a fire, all detectors announce the fire's location in a clear prerecorded voice ("Fire in the basement"). That way you can choose the fastest and safest evacuation route.

Wi-Fi status and shutoff

Wi-Fi-enabled units and smart device apps allow you to monitor your home from anywhere. Check the CO reading and smoke detector status, receive alarm notifications and even shut off a false alarm using an app.

Ionization detectors have gotten smarter

They pack sophisticated software and electronics to reduce false alarms. But they're not foolproof, so don't install them near kitchens or bath areas where they're most easily fooled.

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SMOKE DETECTOR REPLACEMENT TIPS

Note the date

Stick a piece of tape on the back of the smoke detector and write down the installation date. Replace it 10 years from that date.

Always include a carbon monoxide detector

You can buy smoke detectors with a built-in carbon monoxide sensor. But if the combo units don't fit into your photoelectric/ionization scheme, buy plug-in units with battery backup or battery-powered units. Install one on every level in your home. But read the instructions carefully for replacement recommendations, because some CO detectors must be replaced in either five or seven years depending on the type of sensing technology they use.

HOW TO RECYCLE YOUR OLD DETECTORS

Smoke detectors shouldn't be tossed in the trash. Check with your local recycling organization to see if it will accept your old detectors. Many will accept photoelectric detectors but not ionization detectors because they contain radioactive material. In that case, contact the manufacturer for return policies or go to this site for more information: **about.usps.com/postal-bulletin/2012/pb22334/html/cover_025.htm**

EDITOR JASON WHITE • ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA

Handy HINTS®

FROM OUR READERS handyhints@thefamilyhandyman.com

NO-SCRATCH TOOLBOX

I cut and glued a piece of carpet to the bottom of my toolbox to protect surfaces like floors and countertops from scratches. The carpet also makes it easy to slide my toolbox around rather than picking it up just to move it a little way.

Kim Litkenhaus Marino

Reuse drywall cutouts

Whenever I need to make an electrical repair inside a finished wall, I cut an opening with my hole saw and save the round plug. Later, when I'm ready to patch the hole, I glue a piece of rolled-up cardboard to the back of the plug using construction adhesive.

Then I glue the other end of the tube to the drywall on the other side of the wall. I cut the cardboard tube slightly shorter than the depth of the wall studs so that the plug sits just below the surface of the drywall. I then finish off the patch with some joint compound.

James B. Stefan

Free and easy paint tray

For small paint jobs, I find that a 4-in. paint roller works great with an old gallon-size iced tea jug serving as a disposable roller tray. I just cut out part of the plastic to create a place to dip the roller. It even has a built-in carrying handle. When I'm done, I just throw the jug away.

Fred Thies

Get a $100 gift card for your Handy Hint!

See p. 4.

LAST-DITCH NAIL PULLING

If you're trying to pull a nail and the head breaks off, try gripping the nail tightly with a locking pliers, then pull against the pliers.

Tom Willprecht

Scratch-free showerheads

I learned the hard way that pliers can scratch a nice, new showerhead. Now, whenever I need to replace one, I wrap some duct tape around the jaws of my pliers to protect the chrome finish.

Gina Capellin

No more wet garage floor

To prevent my snow blower from dripping all over the garage floor in winter, I keep it on a plastic washing machine pan that I bought at a home center. To keep the edge of the pan from breaking when I roll my snow blower onto it, I beefed it up with two pieces of wood.

Walter Koldanus

Fix for a slippery situation

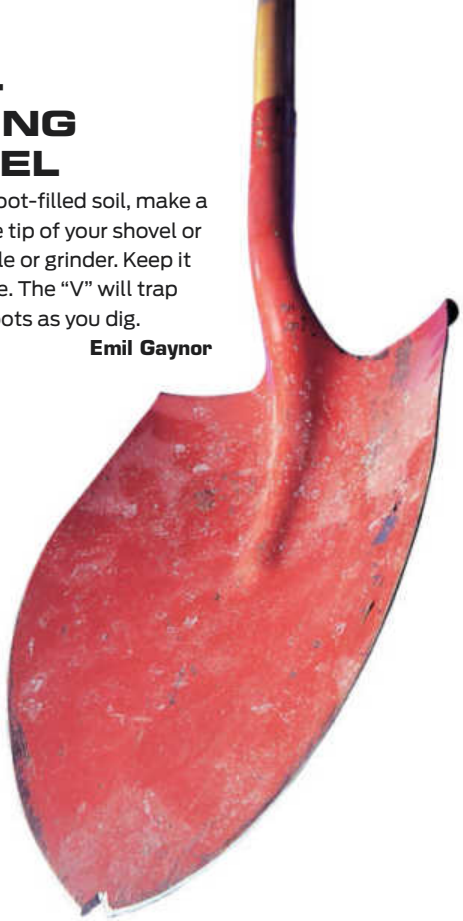
I got tired of my GPS sliding off the dashboard every time I'd take a corner a little too fast. I use a sandbag mount, but it lost its grip over time. Determined to find a solution, I dug around and found a piece of rubbery drawer liner like the kind you put in toolboxes and kitchen drawers. Now my GPS stays put no matter how crazy my driving gets.

Scott McDermott

ROOT-CUTTING SHOVEL

For digging in root-filled soil, make a small "V" in the tip of your shovel or trowel with a file or grinder. Keep it sharp with a file. The "V" will trap and slice the roots as you dig.

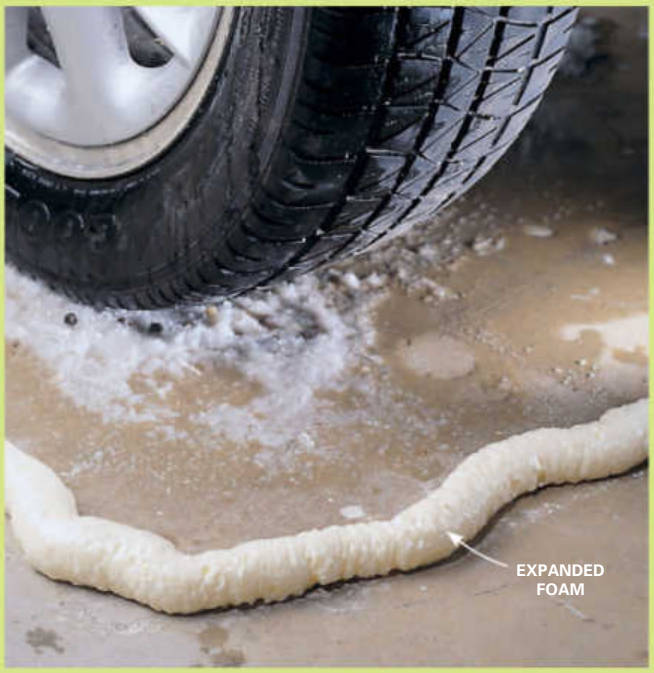
Emil Gaynor



Glue-bottle handle

Sometimes it's hard to pull open the nozzle on a bottle of wood glue, so I cut a small piece of wood with a hole in the middle and installed it between the nozzle and the bottle. The wooden handle is much easier to grab and pull open.

Court Kites



Dams in a garage

Garages without drains sometimes need a way to contain the water from melting snow. I do it by making a dam around the car with minimal-expanding spray foam insulation. Just scrape it off when spring returns.

Don Johnson

Temporary nut holder

How many times have you tried to start a nut over a hard-to-reach bolt and had that paw attached to your arm get in the way? To hold the nut snugly in the end of the socket while you start it, place the nut on a flat surface. Place a piece of thick paper, like from a grocery bag, on top of the nut and press your socket or nut driver over it. The paper acts like a mini wedge to temporarily hold the nut in place. No more searching and diving for the nut that keeps getting away!

Simion Miok

SHOWCASE SHELVING

Stunning looks— and more space!

Nightstands are just not big enough for everything: lamp, alarm clock, phone, photos of your kids ... so books, magazines, your tablet or your cup of tea ends up on the floor.

This shelf unit gives you about 10 times more space for decorative and essential stuff. And its dazzling design will transform your room. Best of all, it's easy to build with basic tools.

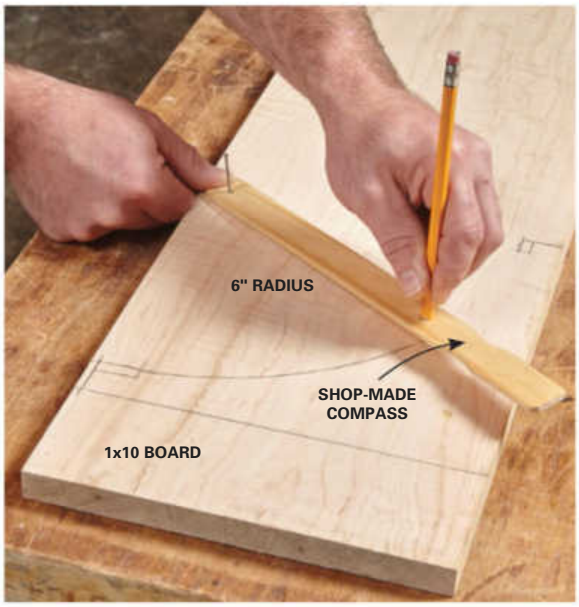
by Jeff Gorton
editors@thefamilyhandyman.com

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **TOM FENENGA** • TECHNICAL ART **JEFF GORTON**

1 CUT PLYWOOD SHEETS INTO STRIPS
Mark the width of the cut on both ends of the sheet. Align the ends of the straightedge guide with the marks and clamp the ends. Make sure to place the guide on the "keeper" side of the marks. Run the saw along the guide to complete the cut.

2 CUT THE STRIPS TO LENGTH
A crosscut guide allows you to make perfectly square cuts exactly where you want them. Mark the cut location and line up the guide. Clamp the guide and make the cut. Make sure to keep the saw bed tight to the guide fence as you make the cut.

3 MARK THE CURVED BRACKETS
Use the dimensions in Figure A to mark the shape of the bracket on the 1x10 board. Drill a nail hole and pencil hole in a scrap of wood to use as a compass. Cut out the shape with a jigsaw. Sand the curve until it's smooth. Then use this bracket as a template to mark the three remaining brackets.



Getting started

The first step is to round up the tools and materials you'll need to build this project. We used birch plywood because it provided the closest grain match to our bedroom furniture. If you're planning to stain the shelves to match your furniture, try to find plywood that has a similar grain pattern. For less common plywood like cherry or walnut, check with a local hardwood supplier, cabinet shop or full-service lumberyard.

If you plan to paint, you can build the shelves out of any plywood with tight grain (birch is a good choice). We used a 2-in. cove molding along the top. You probably won't find this molding at a home center, but you can special-order it or choose a similar profile. The birch plywood, maple boards and trim for these shelves cost a total of about $300.

We've kept the construction simple to allow you to build this project even if you don't have a shop full of tools. All of the plywood is joined with trim-head screws and there are a few spots where the screw head holes are visible. If you own a biscuit joiner or doweling jig, you could eliminate visible fasteners by joining the plywood with biscuits or dowels.

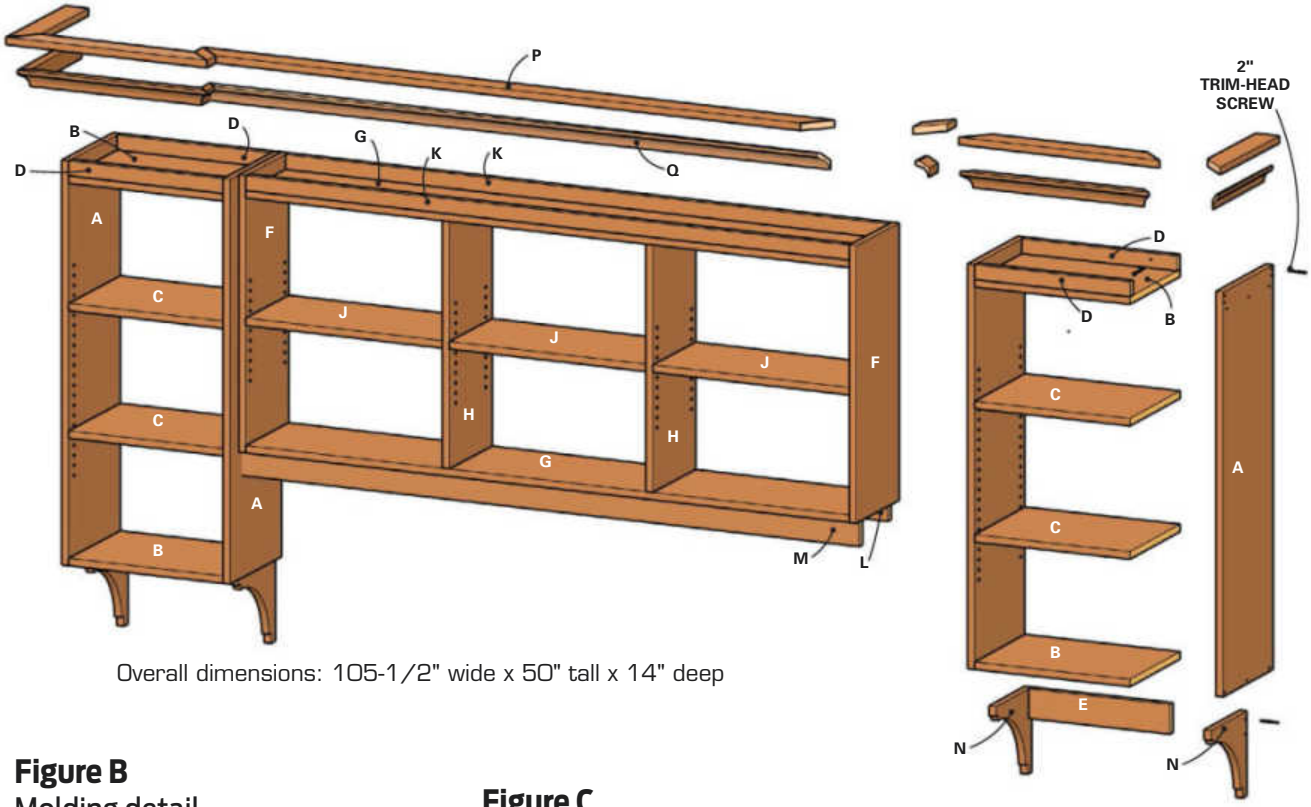
Cut out the parts

Photos 1 and 2 show how to cut the plywood parts using saw guides and a circular saw. Use the Cutting List (p. 37) and **Figure A** as a guide. This plan is sized for a queen-size bed. If your bed is wider than 64 in., you'll have to build the center shelf unit wider. We've added 1/16 in. to the length of part H to compensate for plywood that's only 23/32 in. thick. If your plywood is a full 3/4 in. thick, cut these parts to 24-3/4 in. long instead.

WHAT IT TAKES

TIME: One weekend, plus finishing.
COST: $150 to $300, depending on plywood cost.
SKILL LEVEL: Intermediate to advanced.
TOOLS: Circular saw, jigsaw, miter saw, drill, edge-band trimmer, standard carpentry tools, level.
OPTIONAL TOOLS: Finish nailer, table saw.

Figure A
Showcase shelving



Overall dimensions: 105-1/2" wide x 50" tall x 14" deep

Figure B
Molding detail

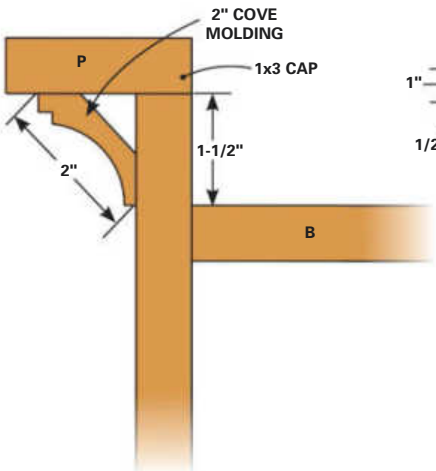
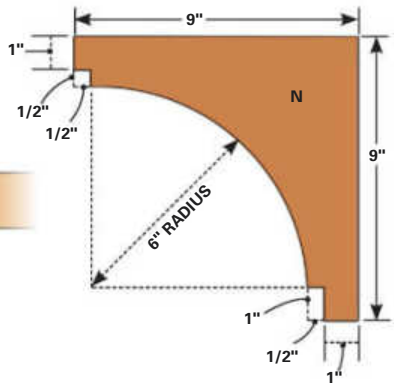


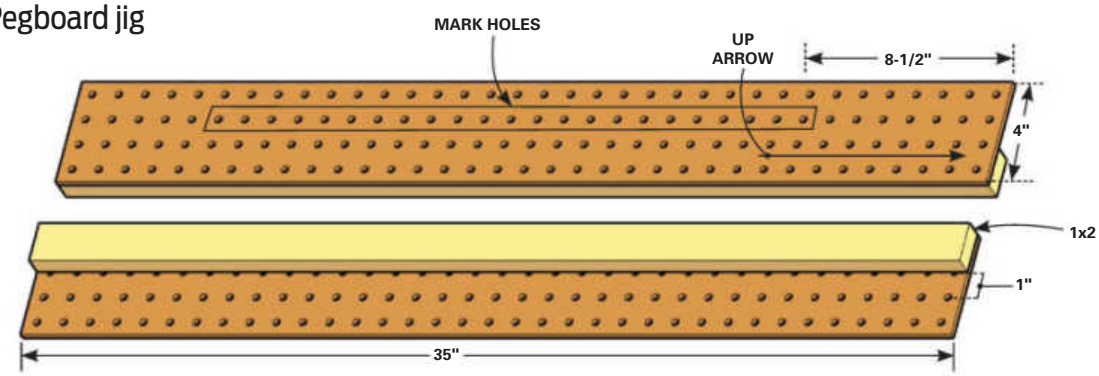
Figure C
Bracket



Materials List

ITEM	QTY.
4' x 8' x 3/4" plywood	2
1x10 board	4 lin. ft.
1x3 board	14 lin. ft.
2" cove molding	14 lin. ft.
Edge-banding veneer	70 lin. ft.
2-3/4" cabinet screws	10
2" trim-head screws	60
1-1/4" trim-head screws	8
1-1/2" finish nails	
1" finish nails	
1/4" shelf pins	28

Figure D
Pegboard jig



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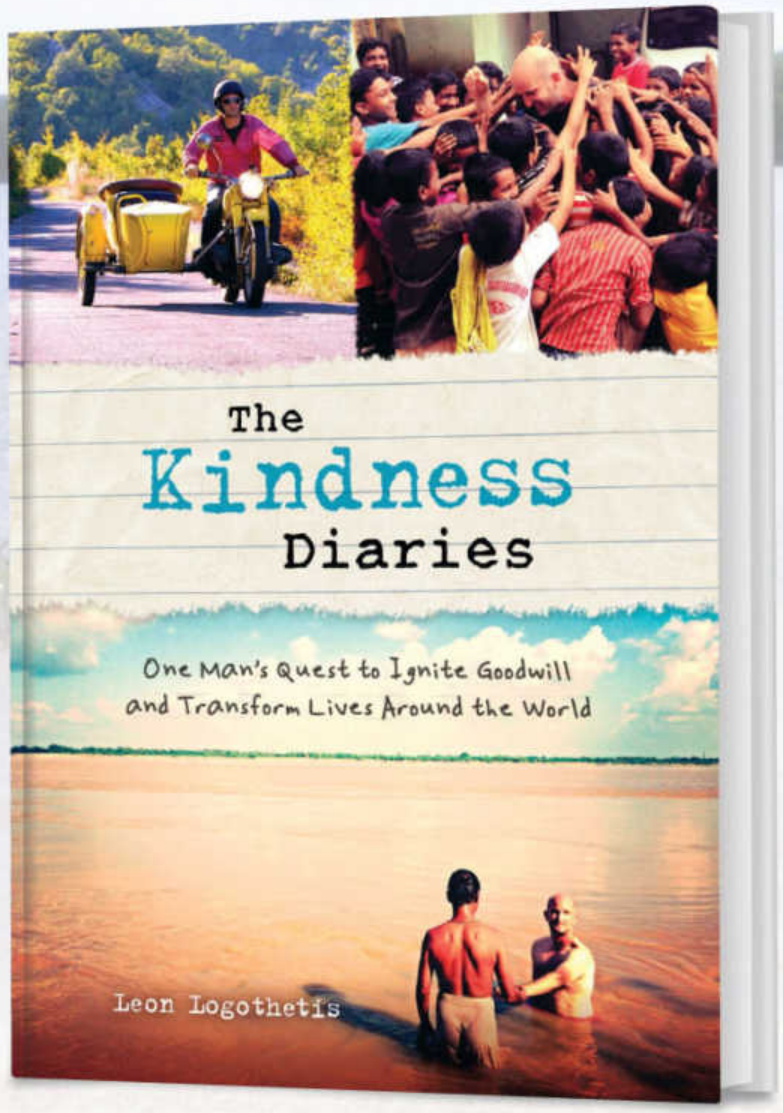

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For help with building the saw guides, go to familyhandyman.com and search for "circular saw long cuts." Make sure to use a top-quality, 40-tooth carbide blade in your circular saw to reduce chipping and tear-out. A table saw, along with a crosscutting sled, would be a good alternative to a circular saw for cutting the plywood.

Cut the brackets (N) from a solid 1x10 board. Using **Figure C** as a guide, mark the shape on the 1x10 board. **Photo 3** shows how to draw the curve. Cut out the brackets with a jigsaw. Then sand the curves to get rid of saw marks and smooth them out. Use the first bracket as a pattern to mark the rest.

Hide the plywood edges

Using iron-on edge-banding veneer is an easy way to finish the plywood edges. You'll find birch and oak edge-banding veneer at home centers, but if you need cherry or some other species, check online or go to a local woodworking supplier.

Photos 4 and 5 show how to apply the edge banding. You only need to apply edge banding to the edges that show. Parts A, F, L, M and E require edge banding on one end as well as the long side. Buy a cheap iron or find one at a garage sale, but don't use your clothes iron. Set the iron to a high setting like "cotton." Practice on a scrap of plywood to get the hang of how fast to move the iron. You want to melt the glue without burning the veneer. Immediately after you iron on the edge banding, slide a small block of wood from end to end while pressing down firmly. This will ensure good adhesion. Trim off the overhanging ends with a sharp utility knife. Then trim off the overhanging veneer from the edges (**Photo 5**).

We show an edge-band trimmer that trims both sides at once, but you can also use a single-edge trimmer. You'll find edge-band trimmers at woodworking stores and online. The FastCap trimmer shown here costs about $20. For more information on edge banding, go to familyhandyman.com and search for "edge banding." Finish up by carefully sanding the edges with 120-grit sandpaper to create a perfectly flush, smooth edge.

4 APPLY EDGE BANDING WITH AN IRON
Cut iron-on edge banding about an inch longer than you need. Center the strip on the edge of the plywood and iron it on. Keep the iron moving. As soon as you're done applying heat, rub over the entire surface with a small chunk of wood to ensure good adhesion. Trim off the overhanging ends with a sharp utility knife.

5 TRIM EDGE BANDING
Starting at one end, slide the special edge-band trimming tool along the edge banding to slice off any overhanging veneer. Carefully sand the edge to remove any trace of overhanging veneer.

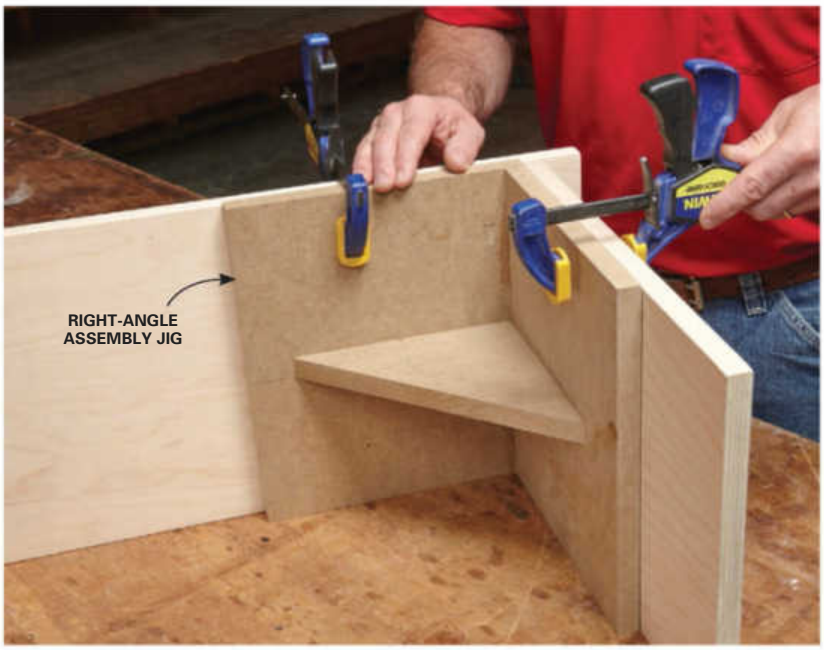
Build the shelf units

With the parts cut and edge-banded, it's time to start building. **Photo 6** shows a simple right-angle jig you can build to help hold the parts in position as you screw them together.

Make light pencil lines across parts A and F to indicate the centerline of parts B and G to help you place the screws accurately. Drill 1/8-in. pilot holes 2 in. from each end and in the center to guide the screws. Then drive the 2-in. trim-head screws until they're slightly recessed (**Photo 7**). Don't worry if the shelves are still a little wobbly. They'll be held firmly in position when you mount them to the wall. While you're at it, screw the pairs of brackets (N) to the cleats (E).

Drill shelf pin holes

For adjustable-height shelves, we drilled a series of 1/4-in. holes to



6 HOLD THE BOX PARTS SQUARE
It's a lot easier to assemble the pieces if you have a right-angle jig to hold them steady while you drill pilot holes and drive screws. Make the jig out of scraps of plywood. Then line up the parts and clamp them to the jig.

7 ASSEMBLE SHELVES WITH SCREWS
For easy assembly, join the sides to the tops and bottoms with trim-head screws. Drill 1/8-in. pilot holes first. Then drive the screws until the heads are slightly recessed. After the first coat of finish, fill the screw head recesses with soft wood putty to match the stain and cover with a final coat of finish.

accept shelf pins. If you don't think you'll adjust the height of the shelves, just drill four holes at each shelf location. It's easier to make sure the holes are aligned if you drill them after you've assembled the shelves. We positioned the shelf pin holes so that a shelf can be centered in the middle unit, and approximately evenly spaced in the two outside units. We also offset the holes in the two center dividers (H) so the pins don't run into each other. Most of the holes are 1 in. from the front and back edges. The holes in the center of the middle unit are 1-1/2 in. from the front and back edges.

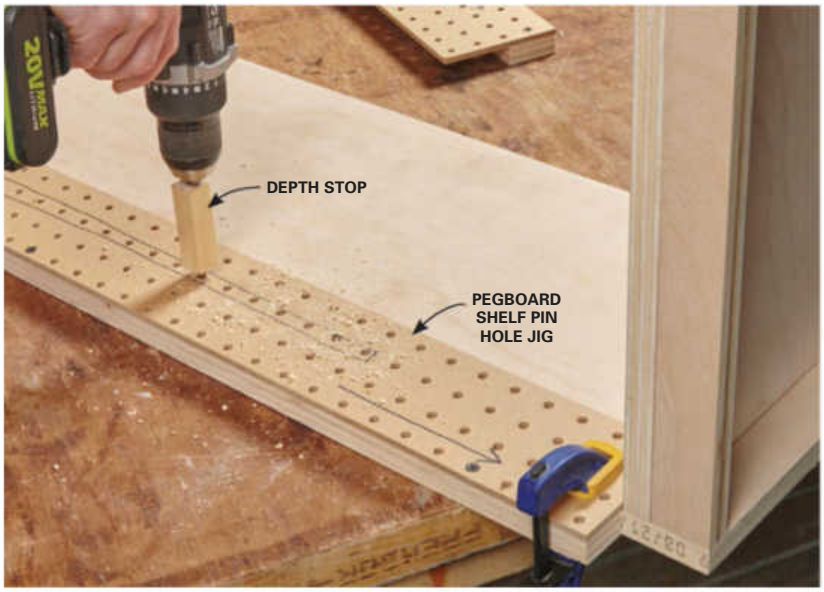
Photo 8 shows how to use a 1/4-in. pegboard jig as a guide for drilling the shelf pin holes. To avoid confusion, we made mirror-image jigs to use on the right and left sides of each upright. Make an arrow pointing up to keep the guide properly oriented and mark the holes you intend to drill. Cut a 3/4-in. square scrap of wood or dowel and drill a hole in it to use as a drill stop (**Photo 8**). Practice on a scrap to get the correct hole depth. Drill all the holes in the taller outside units first. Then cut off the pegboard guides and use them for the middle shelves. Reposition the stop to drill the offset holes for the center shelves.

Mount the shelves

We stained and varnished the shelf units and the moldings that go on top before installing them. If you need help with this part of the project, there's a ton of good information on staining and painting at familyhandyman.com. Whether you're staining or painting the shelves, plan to apply a final coat of finish after they're installed and the moldings are put on. That will allow you to fill the nail and screw head holes and cover them with a coat of paint or varnish.

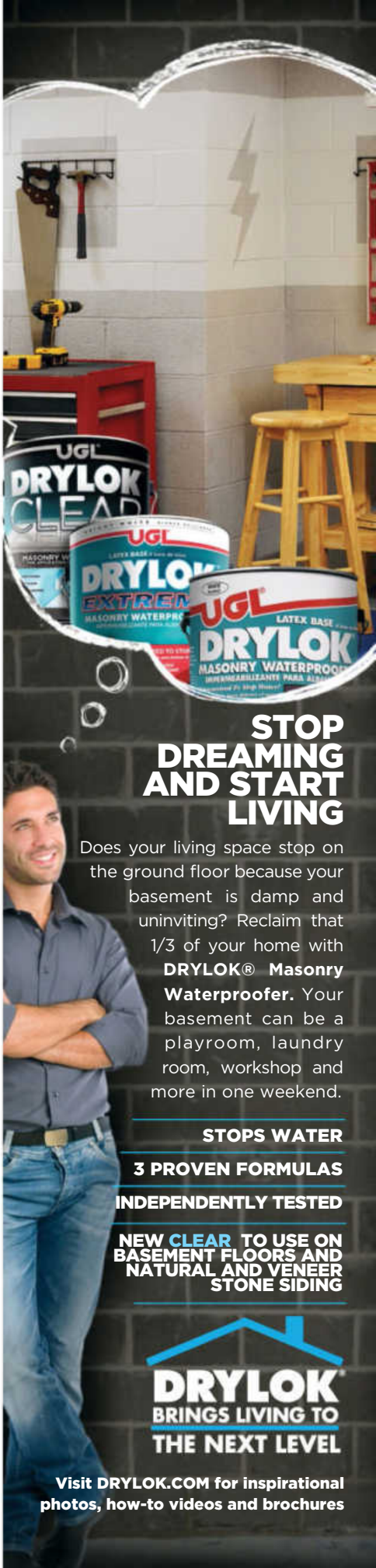
To get ready for the installation, mark the center of the bed with a piece of masking tape. If you have a headboard, mark the height. Then move the bed out of the way. Use a stud finder or some other method to locate the studs and mark them with tape. Then determine how high you want the center shelves to be. We chose to position the shelves a few inches above the headboard, which in our case was 60 in. above the floor. This is a good height to allow headroom for sitting up in most beds. Draw a level pencil line at your chosen height. Align the plywood ledger (L) with the mark, center it on the bed location and fasten it to the studs with trim-head screws. Now it's easy to install the center shelf unit by resting it on the cleat. Before you screw the center shelf unit to the studs (**Photo 9**), make sure the ends are lined up with the plywood ledger and the sides are perfectly plumb.

Next install the two outside shelf units by lining up the tops and screwing through the hanging strip (D) into the studs (**Photo 10**). Connect the shelf units with 1-1/4-in. trim-head screws.



8 DRILL HOLES FOR SHELF PINS
To avoid mix-ups, drill the shelf pin holes after assembling the shelves. Build mirror-image drill guides from 1/4-in. pegboard with 1x2 stops. Drill a hole in a block of wood to use as a drill-bit depth stop.

9 MOUNT THE CENTER SHELF
Level the ledger (L) and attach it to the wall studs with trim screws. Rest the center shelf unit on the ledger, aligning the sides with the ends of the ledger. Make sure the sides are plumb. Then drive screws through the hanging cleat into the studs to hold the shelf in place. Drive trim-head screws down through the bottom shelf into the ledger.



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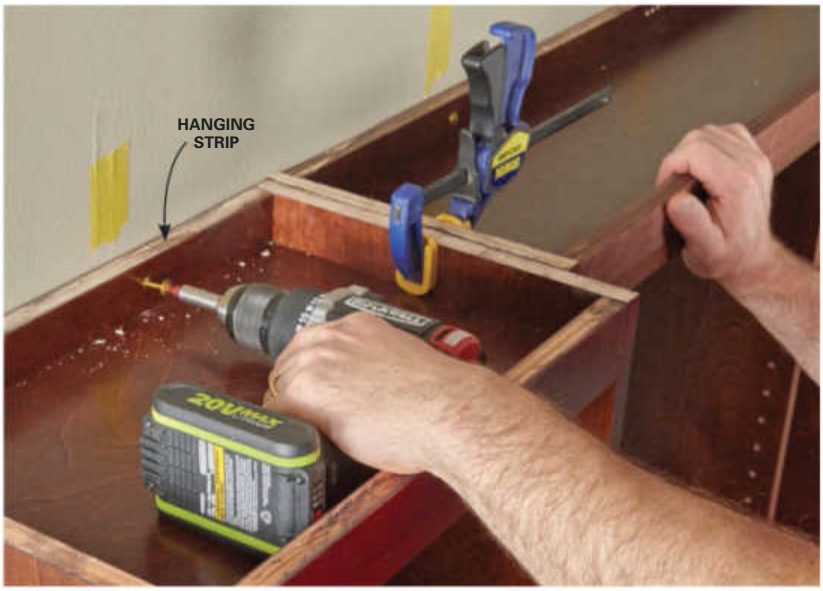


10 ADD THE END UNITS
Align the top of the outside shelf unit with the top of the center shelf unit. Make sure the top is level. Then drive screws through the hanging cleat into wall studs to support it. Center the decorative brackets under the shelf and attach them to the wall studs with screws.

11 INSTALL THE COVE MOLDING
Finish up by installing the cap and cove molding to the tops of the cabinets. Miter the inside and outside corners. We used a finish nail gun, but you can also drill pilot holes and attach the moldings with trim nails. Fill the nail holes with soft putty to match the stain.

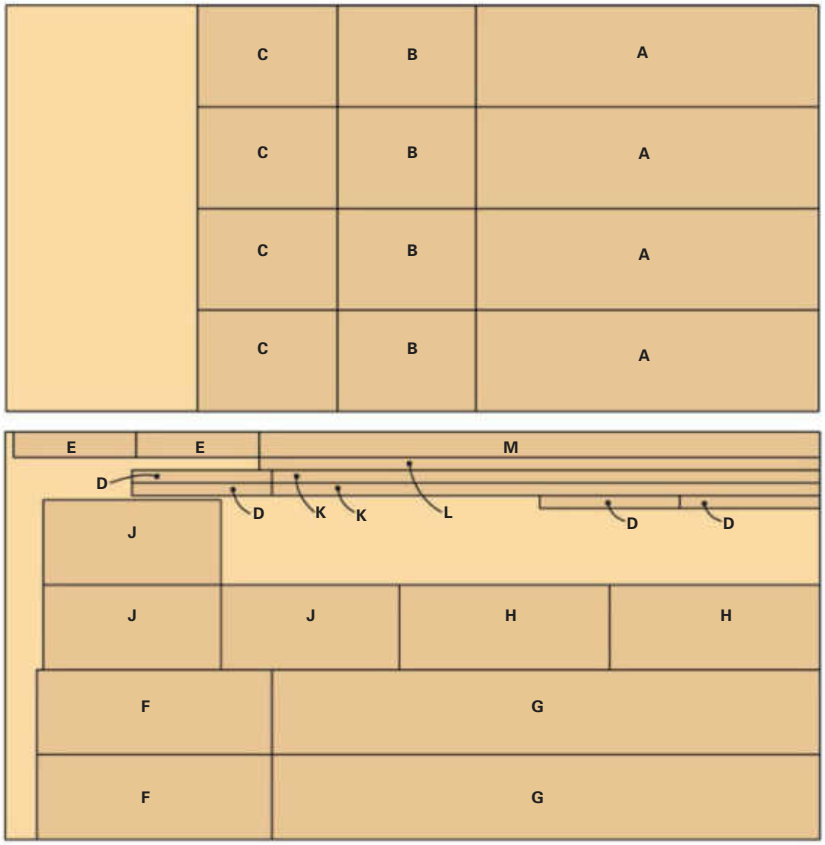
Snug the brackets (N) up to the bottom of the outside shelves and screw through the hanging cleat (E) into the studs.

Finish up by installing the molding

The final step is to cut and nail on the 1x3 cap and 2-in. cove molding that fits under it (**Photo 11**). Start by cutting the cap pieces and nailing them onto the top of the shelves. We used a finish nailer. If you're hand-nailing the cap and moldings, drill pilot holes for the finish nails to avoid splitting the cap or moldings. Hold the back edge of the 1x3 cap flush to the back of the plywood and cut 45-degree miters at the corners.

Install the cove molding (Q) after the cap is done. Miter the outside corners. Since the inside corners will be

Figure E
Cutting diagrams



Cutting List

KEY	QTY.	DIMENSIONS	NAME
3/4" PLYWOOD			
A	4	11-7/8" x 40"	Outside sides
B	4	11-7/8" x 16-1/2"	Outside tops and bottoms
C	4	11-7/8" x 16-3/8"	Outside shelves
D	4	1-1/2" x 16-1/2"	Outside hanging and filler strips
E	2	3" x 15"	Bracket hanging cleat
F	2	9-7/8" x 27-3/4"	Center sides
G	2	9-7/8" x 64-1/2"	Center top and bottom
H	2	9-7/8" x 24-13/16"	Center dividers
J	3	9-7/8" x 20-7/8"	Center shelves
K	2	1-1/2" x 64-1/2"	Center hanging and filler strips
L	1	1-1/2" x 66"	Center ledger strip
M	1	2-1/2" x 66"	Center light valance
BOARDS AND MOLDING			
N	4	Cut to pattern	Brackets
P	7	3/4" x 2-1/2" (cut to fit)	Cap
Q	7	Cut to fit	Cove molding

perfectly square, you should be able to miter them rather than cope them. But you can use whichever method you prefer. Take your time and expect to spend several hours on this part of the project. There are a lot of little pieces to cut. Keep your fingers a safe distance from the blade by cutting the small pieces of cove molding from long lengths.

When you're done mounting the shelves and installing the moldings, nail and screw head holes will be showing. If your shelves are stained, fill the holes with soft wood putty to match. You can even blend colors to get a closer match. For painted shelves, fill the holes with light-weight spackle, let it dry and sand it. Then apply the final coat of finish.

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YOUR CLOSET CAN LOOK LIKE THIS!

by Jason White
editors@thefamilyhandyman.com

CUSTOM CLUTTER BUSTER

From anarchy to order in a weekend! (melamine panels make it easy)

Walk through the closet aisle at any home center and you'll see lots of closet organizers—everything from wire shelving systems to ones that look like real wood cabinetry with all kinds of fancy accessories. And while these systems are designed to work in just about any type of closet, you can get a fully custom closet organizer—and possibly even save a few bucks—by building one yourself. Here's how we built ours using melamine panels, plus some tips on building your own.

What is melamine?

While real wood is strong and beautiful, building a closet organizer with it is expensive and time-consuming. Melamine products are an attractive and inexpensive alternative to wood or plywood. These boards, panels and sheets are made of particleboard with a tough, factory-applied melamine finish similar in appearance to plastic laminate. A 4 x 8-ft. melamine sheet is about half the cost of cabinet-grade plywood and available in a variety of colors. Be warned, however. Most home centers stock it only in white, which is what we used for our project.

Predrilled panels save you time

At most home centers, you'll find 4 x 8-ft. melamine sheets (about $25 each). These full sheets are by far the most economical choice, but we bought 15-3/4-in. x 97-in. panels instead (about $20 each). These smaller panels come with banding on one or two edges and are available with or without predrilled shelf pin holes. So although we spent about three times as much as we would have on full sheets, we avoided hours of drilling and edge banding—plus the strain of transporting, lugging and cutting big, heavy sheets. Some home centers carry small melamine panels, but you may have to special-order them or shop online. Plan to cut 1/2 in. off each end to remove the ragged edges.

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA • TECHNICAL ILLUSTRATION FRANK ROHRBACH III

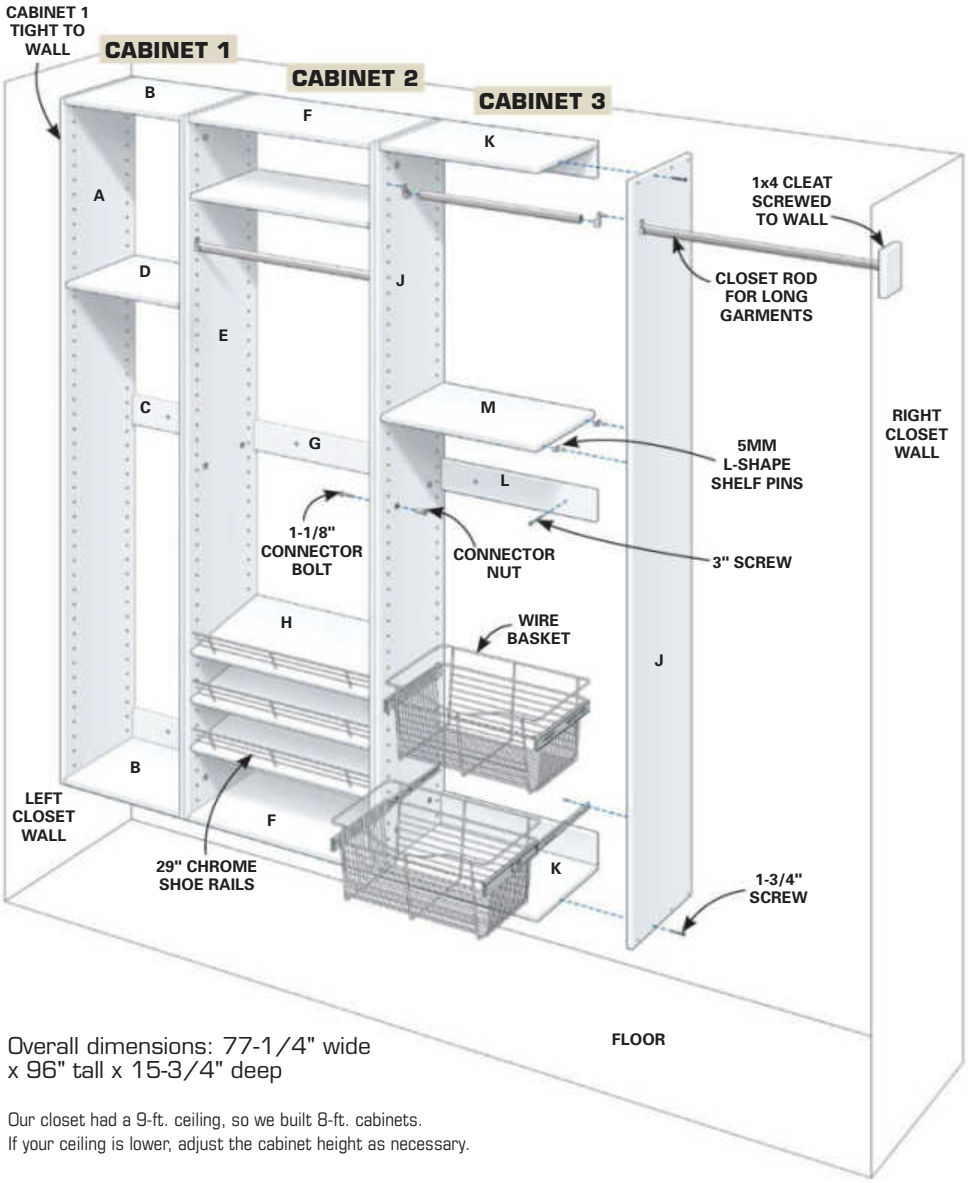
HOW WE BUILT OURS

WHAT IT TAKES

TIME: 1 to 2 days
COST: $250 to $500
SKILL LEVEL: Beginner to intermediate
TOOLS: Circular saw, cordless drill/driver, hammer, one or two pipe clamps, framing square, 6-ft. level, hacksaw.

Time and money

If you're an ace woodworker, you can probably build an organizer like ours in one day. If not, expect to spend a full weekend. You'll find everything you need to build it at most home centers. The melamine for our project cost about $250. But if you plan to add fancy accessories like we did, your final cost might be much higher. We spent about $250 on accessories and fasteners.



Overall dimensions: 77-1/4" wide x 96" tall x 15-3/4" deep

Our closet had a 9-ft. ceiling, so we built 8-ft. cabinets. If your ceiling is lower, adjust the cabinet height as necessary.

Cutting Lists

	KEY	QTY.	DIMENSIONS	NAME
CABINET 1	A	2	15-3/4" x 96"	Sides
	B	2	15-3/4" x 19-1/4"	Top and bottom
	C	3	4" x 19-1/4"	Hanging strips
	D	7	15-3/4" x 18-7/8"	Adjustable shelves
CABINET 2	E	2	15-3/4" x 96"	Sides
	F	2	15-3/4" x 29-1/2"	Top and bottom
	G	3	4" x 29-1/2"	Hanging strips
	H	4	15-3/4" x 29-1/8"	Shoe shelves; adjustable shelves
CABINET 3	J	2	15-3/4" x 96"	Sides
	K	2	15-3/4" x 24"	Top and bottom
	L	3	4" x 24"	Hanging strips
	M	3	15-3/4" x 23-5/8"	Adjustable shelves

Materials List

ITEM	QTY.
3/4" x 15-3/4" x 97" melamine panels (one banded edge with 5mm shelf pin holes already drilled)	6
3/4" x 15-3/4" x 97" melamine panels (one banded edge; no shelf pin holes)	7
Rev-A-Shelf 29" chrome shoe rails	3-pk.
Rev-A-Shelf 24" chrome wire baskets with full-extension slides	2
Rev-A-Shelf 14" valet rod	1
1-3/4" coarse-thread screws and plastic caps	102
3" No. 10 cabinet installation screws	6
1x4 ledger board	1
5mm L-shape shelf pins	56
1-1/8" connector bolts and nuts	12
36" oval closet rod (cut to length with hacksaw)	1
24" oval closet rods (cut to length with hacksaw)	2

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TIPS FOR BUILDING WITH MELAMINE

CHOOSE YOUR HARDWARE FIRST

If you're planning to install accessories similar to the ones we used for our project, be sure to buy them before you build the cabinets. Our wire baskets required a 24-in. opening, while the shoe shelf rails needed a 29-1/2-in. opening to allow for the width of the shoe shelves (with rails installed) plus the shelf pins.

PROTECT YOUR HANDS!
Wear snug-fitting, rubber-coated gloves while working with sharp-edged melamine.

PREVENT CHIP-OUT

You can cut melamine with a circular saw and regular woodcutting blade, but its brittle faces are prone to chipping out. To minimize this problem, use a 60-tooth, carbide-tipped blade and apply masking tape to the top side of your workpiece wherever you make a cut.

Make perfect cuts every time

One of the challenges of using a handheld circular saw is making perfectly straight and square cuts. For our project, we used a self-squaring crosscut jig for cuts across panels, and a longer jig for cutting long, narrow pieces like the hanging strips. These jigs also help reduce chip-out. The jig shown here is just a narrow piece of 3/4-in. plywood glued on top of a wider piece of 1/4-in. plywood, and it has a squaring fence on the bottom. To see how to make similar jigs, go to familyhandyman.com and search for "saw cutting guides."

Edge banding hides the ugly

The finished faces of melamine panels look great, but the raw edges don't. You might be able to build your organizer without having to apply any edge banding at all if you orient the raw edges so they're not visible once the organizer is installed. If that's not possible, you'll need to apply iron-on edge banding, which is available at any home center. Be sure to buy an edge trimmer, which you can pick up for about $15. For edge-banding tips, go to familyhandyman.com.

Drill pilot holes

We assembled each of the three cabinet boxes for our closet organizer by first drilling pilot holes with countersinks and then driving 1-3/4-in. coarse-thread screws. These screws are designed to be self-drilling, but the particleboard in melamine has a tendency to crumble and blow out easily, so drilling pilot holes is worth the effort.

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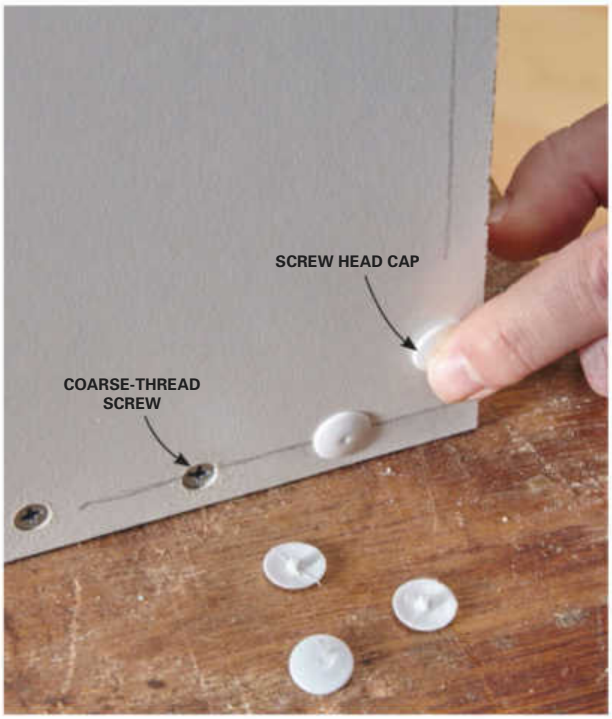
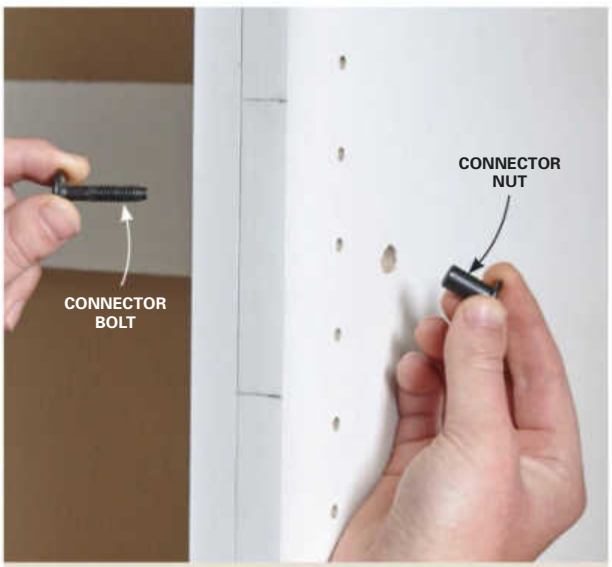


HIDE THE SCREW HEADS

The home center where we bought our melamine panels sells small bags of screws—labeled "melamine screws"—that are packaged with white plastic caps to hide the screw heads. You just press them on with a finger, then give each one a light tap with a hammer.



Connector bolts tie it all together

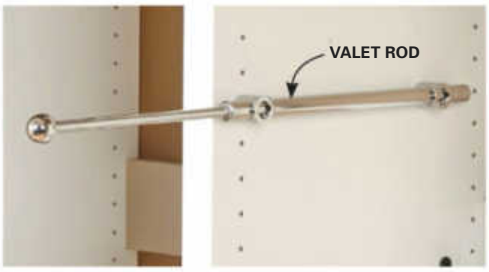
With the boxes screwed to the wall, drill holes and use connector bolts and nuts to join the sides of the cabinets. This will close any gaps between the boxes and stiffen up the entire assembly. Be sure the front edges of the cabinets are flush with each other before joining. If they're not, loosen the wall screws and adjust as needed.

A ledger board makes installation easy

Once assembled, each cabinet box weighs about 100 lbs. To make hanging them easier, screw a 1x4 or 2x4—called a ledger board—to the back wall of the closet down near the floor. Make sure it's perfectly straight and level. Mark the stud locations with masking tape. Then get somebody to help you lift each box onto the ledger board, which will hold it in position until you can screw it to the wall. Drive 3-in. washer-head screws through the hanging strips of all three boxes and into the wall studs.

Accessorize!

Instead of building drawers for our closet organizer, we decided to purchase Rev-A-Shelf wire baskets with full-extension slides. This company makes lots of different closet accessories, including the shoe shelf rails and valet rod that we installed. Other companies make similar accessories. Search for "closet accessories" or "closet hardware" online and you'll find a huge variety. We also installed oval closet rods with brackets that you insert into the cabinets' shelf-pin holes, which makes for super-easy height adjustments.



CLOSET IN A BOX

Want a closet organizer but don't want to measure and cut all the parts yourself? Your local home center sells precut closet kits that you just assemble and install. You'll likely pay a bit more for the convenience. A bigger downside is you won't be able to customize your closet exactly as you'd like.

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FORGET IT... REGRET IT!

Ignoring these little jobs can lead to big trouble

by **Mark Petersen**
editors@thefamilyhandyman.com

You probably already have a home maintenance checklist: Replace the furnace filter each season, shut off water spigots before winter, clean the gutters, etc. That's a good start, but there are jobs that homeowners often forget about, or don't even know about. Here are some important home maintenance items that may not be on your list—items that may cause a big headache, or worse, cost you big money if you neglect them.

TEST THE SUMP PUMP... *OR RISK A FLOOD*

Last spring, I got home from a weekend trip to discover my entire basement floor covered in 1/2 in. of water. After shutting down the power, I waded over to the sump pump and noticed it wasn't working. Upon closer inspection, I realized that the cable attached to the float must have gotten tangled somehow. It took me two seconds to untangle the cable, and then I spent the next 15 hours dragging out waterlogged carpet, running the wet/dry vac and moving fans around.

To avoid future disasters, I bought a pump with a vertical float switch. I've also started to check my pump at least a couple times a year by dumping water into the basin to make sure everything is working properly.

David McGargill is a *TFH* Field Editor and remodeling contractor from Alburnett, IA.

CHECK FOR HIGH WATER PRESSURE… *OR WRECK FIXTURES AND APPLIANCES*

I was recently on a service call to assist a water softener installer. He was replacing a fairly new softener because the first one had ruptured and filled the pipes with little zeolite beads.

He didn't seem too worried about why the first one failed, but I did a little investigating. A water pressure test gave a reading of more than 110 lbs. psi. The culprit was the 20-year-old pressure-reducing valve. I installed a new valve, which brought the pressure down to about 75 lbs. Pressure-reducing valves are usually found near the main water shutoff valve, but not all homes have them. It depends on your municipality.

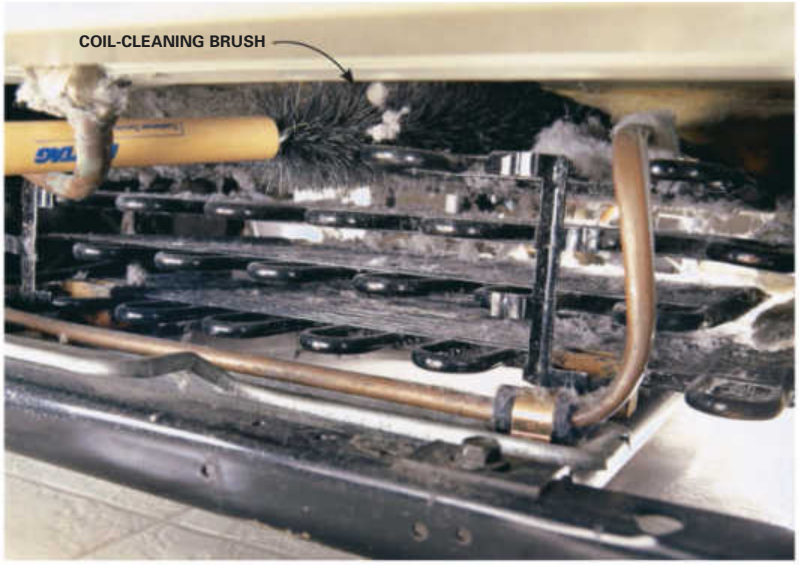
High water pressure can harm pipes and connections, and appliances, and create water hammer and waste massive amounts of water. Checking for high water pressure is an often overlooked maintenance item, and one that's easy enough to perform. A new pressure-reducing valve costs less than $100, and a simple pressure gauge like this one that hooks up to a spigot or laundry tub faucet costs about $10. Both are available at home centers.

Les Zell is a Field Editor and owner of Zell Plumbing in St. Paul, MN.

CLEAN WINDOW WEEP HOLES… *OR INVITE RAINWATER INTO YOUR HOUSE*

Many sliding windows and vinyl replacement windows have weep holes on the exterior bottom of the frame. These holes are designed to drain away rainwater that can collect in the frame's bottom channel. Weep holes can get plugged with bugs and debris, and if that happens, water could fill up the channel and spill over into your house.

To see if your weep system is working, simply pour a glass of water into the track or spray the outside of the window with a garden hose. If you don't see a steady stream of clean water exiting the weep hole, poke a wire hanger into the hole, or spray it out with compressed air, and wet it down again. If the little flapper (designed to keep out driving wind) is stuck shut, it can be removed with a putty knife and replaced.



CLEAN REFRIGERATOR COILS… *OR PAY UNNECESSARY REPAIR BILLS*

Refrigerator condenser coils are located on the back of the fridge or across the bottom. When coils are clogged with dust, pet hair and cobwebs, they can't efficiently release heat. The result is your compressor works harder and longer than it was designed to, using more energy and shortening the life of your fridge. Clean the coils with a coil-cleaning brush and vacuum. A coil-cleaning brush, which is bendable to fit in tight areas, does a thorough job. It costs about $10. Look for one online or at appliance stores.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **HSP** • ILLUSTRATION **STEVE BJÖRKMAN**

KEEP WINDOW WELLS CLEAN… *OR RISK A BROKEN WINDOW AND WET BASEMENT*

I'd never had a problem with water in my window well, so I never thought to clean it out. But recently, we had an average rainfall, not even a heavy downpour, and thanks to a clogged gutter, a lot of water got dumped next to my house and into my window well. The leaves acted like a pool liner in the well, preventing drainage, and the water level rose higher and higher until the pressure broke the basement windows. Gallons and gallons of water poured into the basement, ruining everything in sight. Unfortunately, I had no insurance coverage for that type of flood. Now I keep the window well clean with a cover I bought at a home center.

Pet Grealish is a *TFH* Field Editor from Pocasset, MA, and works as a homeowner's insurance inspector.

DRAIN SEDIMENT FROM YOUR WATER HEATER… *OR EXPECT A SHORTER LIFE SPAN*

I called a plumber because my water heater wasn't heating, and furthermore, it was leaking. Right away, he asked if I had been draining some of the water from it every year. Now why would I want to do that? It turns out that sediment will collect at the bottom of the tank. This creates hot spots on gas-powered heaters that can damage the tank and cause premature failure. On an electric water heater, sediment buildup can cause the lower heating element to fail. So occasionally draining a water heater will lower energy bills and extend the life of the heater. I drain my new water heater at least once a year.

Tomkin Lee is a Field Editor and software engineer from Sparta, NJ.

LUBE GARAGE DOOR SPRINGS… *OR REPLACE THEM SOONER RATHER THAN LATER*

Coat the overhead torsion springs mounted above roller tracks with a garage door lubricant. All springs will eventually break because of metal fatigue and/or corrosion, but lubing them at least once a year will make them last longer. Spraying can be messy; it's smart to protect the wall behind the spring with a piece of cardboard. Garage door lubricant costs about $7 at home centers. Lube the rollers, hinges and track while you're at it. For more garage door maintenance tips, search for "garage door tune-up" at familyhandyman.com.

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CHECK FOR MOUSE NESTS...
OR DAMAGE EQUIPMENT

Mice love to winter in enclosed places like engine compartments, window A/C units and lawn tractor nooks and crannies. If a vehicle or piece of equipment has been sitting unused for a while, check for mice nests before you start it up. The last thing you want to do is take out your boat and discover that you have little furry stowaways that have chewed through half the wires. Mice nests can also cause electronics to overheat and can get sucked into and clog carburetors.

CLEAN DRYER VENTS...
OR WASTE ENERGY AND RISK A FIRE

A plugged dryer vent will cause your dryer to run inefficiently, and that's bad. A plugged dryer vent could also cause a house fire, and that could be deadly! Dryers that are centrally located in houses are most prone to plugging because of the longer ducts. Excess lint is only one reason ducts get clogged; nesting pests and stuck exhaust hood flappers can also cause backups. Stronger odors and longer dry times are two signs your vent is plugged.

You'll have to remove the vent from the back of the dryer to clean it. Suck debris from the ducts with a wet/dry vac, or ream them out with a cleaning kit that includes a brush on a long flexible rod that attaches to a power drill. The kits are available at home centers for $20. If your ducts need replacing, get smooth metal ducts, which will stay cleaner longer than the rough corrugated surface of flexible ducts. Avoid plastic ducting altogether; it can be a fire hazard.

CHECK GARAGE DOOR BALANCE...
OR WRECK YOUR OPENER

A properly balanced door is less likely to injure someone or something and keeps the door opener from working too hard, which will shorten its life.

To check the balance on a door, close the door and then disengage the opener by pulling the opener release handle. Manually pull up the door about halfway and let go. A properly balanced door will stay in the halfway position by itself. If it falls, the tension needs to be increased. If the door rises, the door spring has too much tension, which means it's working harder than it needs to.

Check the door a couple times a year. Adjusting the spring tension is tricky and dangerous. Call a garage door professional to perform the service, or search for "advanced garage door repairs" at familyhandyman.com.

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PRO tips

BY MARK PETERSEN editors@thefamilyhandyman.com

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA

Smart remodeling

One of the most important tasks of any remodeling project is protecting the parts of the house that are *not* being worked on. And that's not easy considering the hundreds of trips back and forth with tools, materials and debris. And then there are the muddy boots, billowing clouds of dust and the occasional dropped tool (which always seems to drop sharp edge down on a finished surface).

We talked with Josh Risberg, a remodeling pro, and he gave us some great tips and told us about some of his go-to products. With his advice, you'll be able to keep certain parts of the house safe and sound while all heck is breaking loose in the others.

MEET THE EXPERT

Josh Risberg has spent 13 years in the remodeling business, the last 10 of them as a lead carpenter for high-end remodeling and new-construction firms. Lucky for us, Josh is the new lead carpenter for *TFH*.

WRAP WINDOW TREATMENTS

Most window openings that will be exposed to dust should be entirely covered with plastic. But for windows you need to open, cover the window treatments in plastic instead of removing them. Removing window treatments is risky business: Parts disappear; metal slats bend; fabric rips or gets dirty. And replacing damaged treatments can get expensive—if you can even find one that matches, that is. Tape plastic to the top of the casing, then tuck the plastic up underneath and behind it. Open the window to tape the plastic on the back of the treatment to the top jamb.

Cover registers with furnace filters

Covering registers will keep dust out of the ducts and furnace. But don't cover them in plastic because blocking airflow to and from the furnace can put an excessive load on the blower motor. Instead, tape inexpensive furnace filters over the registers. The filters will maintain airflow while containing the dust.

It's still a good idea to shut down the entire HVAC system while performing super-dusty tasks like demolition and drywall sanding. And be sure to continually check and replace the actual furnace filter as needed during that dusty work.

FRICTION-FIT DUST BARRIER

Every remodeler knows that building a temporary wall covered in plastic is a great way to keep dust from migrating to other parts of the house. But here's how to do it in a finished room without damaging the surfaces. Wedge strips of R-11 insulation (3-1/2 in. thick) between the framing and the ceiling and the walls. The insulation creates a friction fit and holds everything in place without fasteners. The insulation also allows a little air to flow but acts as a filter.

Start by setting the bottom plate on the floor where you want it. Hold up the top plate with insulation on top of it. Have a helper wedge a couple studs between the top and the bottom plates every 4 ft. or so. Cut the studs 3-3/8 in. shorter than the wall. That allows for the thickness of the plates and leaves a 3/8-in. gap to squish the insulation. Install the plastic with a staple gun rather than a hammer tacker so you don't knock the wall over. Double up the plastic at the top for a more secure hold. Write "Don't Lean on Wall" with a marker to prevent unfortunate accidents.

Remove the screens

Screens and construction don't mix. One of the very first tasks of any remodeling job is to remove all the screens from any window or door that could be in harm's way. Label each one so they all find their way back to the right place. Wrap them in plastic and put them in some safe out-of-the-way location.

Lay down a wood chip path

Some remodeling projects involve walking back and forth across a muddy yard that has no pavement or grass, and keeping that mud out of the house is a challenge. Temporary plywood walkways are one option to keep the muck at bay, but plywood seems to sink into mud and eventually becomes as dirty as the ground around it.

When wood chip paths get muddy, you can just lay down another layer. Wood chips work better than stringy mulch, and some varieties cost less than $4 per bag.

Paint-on tub protection

Marring a beautiful bathtub with a big, ugly scratch is not a good way to showcase a bathroom remodel. Protect a tub by covering it with a thick, tough rubbery coating. Tub protection products like this one are brushed or rolled on, and then peeled off when the job is done.

You'll usually need two coats. The product costs about $50 per gallon, and one gallon will handle two standard-size tubs. That sounds expensive, but it's cheap insurance to protect a tub that might cost hundreds or even thousands of dollars. You can find several manufacturers by searching for "tub protection paint" online.

COVER THE COUNTERTOPS

Any flat surface in a work zone inevitably becomes a workbench or storage shelf, even if that surface is an expensive countertop. Protect countertops from nicks and scratches by covering them in cardboard. Use clean cardboard and wipe the counter before laying it down. Tape the edges to keep out debris and to keep the cardboard from sliding around.

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Protect corners with cardboard

A daily parade of building materials, tool belts and tools is hard on finished walls. Even the most careful worker is going to bump one now and again. Fixing wall dingers is easy enough, but fixing a bent corner bead can be a real pain.

Protect outside corners with strips of cardboard. You can cut them out of thick shipping boxes or buy a FlexCorner box of 10 at protectiveproducts.com for less than $30. Be sure the cardboard extends at least 4 ft. high, and hold it in place with painter's tape, which won't ruin the paint when it's removed.

Make pathways all over

Protecting the floor that leads from the work area to the outdoors is a no-brainer. But don't forget about the paths less traveled, like the one to the bathroom or to the room where the electrical panel is located.

Rolling out plastic floor protector is easy. It doesn't offer heavy-duty protection but is good enough for the occasional trip. Self-adhesive carpet protection film like this costs about 20¢ per foot. Similar protection is available for hardwood floors.

THRESHOLD SHIELD

Sure, all thresholds will get beat up eventually, but why not avoid the wear and tear until after the work is done. Some new doors come with plastic threshold protectors. Keep those in place until the end of the project. Use tape to protect those doors that don't come with a protector, as well as existing doors that will be used a lot during the remodel. A couple layers of exterior painter's tape will hold up great.

Booties are cheap and easy

Avoid tracking filth all over the house with a pair of protective shoe covers. It's easier than untying and retying your shoes or boots when you need to run to a part of the house without floor protection in place. Booties are cheap; you can find them for as little as 30¢ each at some home centers.

MAKE IT LAST!

Avoid repairs, frustrations & wasted cash!

by Mark Petersen
editors@thefamilyhandyman.com

Making your stuff last longer is a great way to get more bang for your buck, and there are dozens of ways to do that, many of which you probably already know: changing the oil in your car, putting on a fresh coat of paint, etc. But we've gathered some great tips that may be new to you, tips that will help you get the most out of your house, tools and even your clothes.

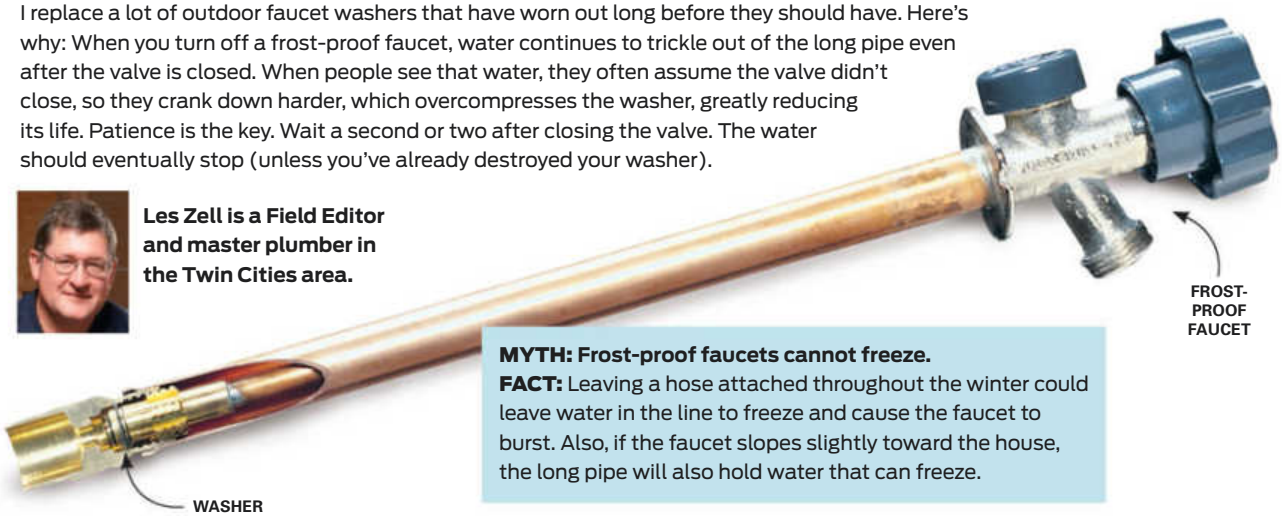
COVER YOUR TOES

Extend the life of your work boots or shoes by coating the toes with a rubbery protective shell. The product shown here is called Tuff Toe and can be found at shoe stores or online for less than $25. Boot Guard is another brand.

DON'T WRECK AN OUTDOOR FAUCET

I replace a lot of outdoor faucet washers that have worn out long before they should have. Here's why: When you turn off a frost-proof faucet, water continues to trickle out of the long pipe even after the valve is closed. When people see that water, they often assume the valve didn't close, so they crank down harder, which overcompresses the washer, greatly reducing its life. Patience is the key. Wait a second or two after closing the valve. The water should eventually stop (unless you've already destroyed your washer).

Les Zell is a Field Editor and master plumber in the Twin Cities area.



MYTH: Frost-proof faucets cannot freeze.
FACT: Leaving a hose attached throughout the winter could leave water in the line to freeze and cause the faucet to burst. Also, if the faucet slopes slightly toward the house, the long pipe will also hold water that can freeze.

LOOSEN BAND SAW BLADES

Band saw blades that are always under pressure can break prematurely from metal fatigue. Extend the life of your blades by releasing the blade tension whenever your saw will sit idle for three days or longer. Some saws have a quick-release mechanism, which makes this a cinch. Otherwise, rotate the tensioning knob two or three complete turns.

PROTECT GARDEN HOSES FROM SUN DAMAGE

UV light from the sun slowly destroys plastics, so if you can't keep your garden hose out of the sun, wipe it down with some Armor All or similar protectant in the spring and again midsummer. I set the hose on plastic or cardboard, spray the whole thing down and then wipe it with a rag.

David R. Jones, PE, is a Field Editor from Cottage Grove, WI, and an engineering and design manager for Temperature Systems Inc.

KEEP THE ROOF CLEAN

Leaves and moss can trap water and cause your roof to deteriorate prematurely. You could blow the leaves off a low-pitched roof with a leaf blower. On steeper roofs, you could pull them off with a broom on an extension pole. And trim back all branches that are close to or touching the shingles.

Chemically treat mold, then sweep it off with a soft broom. A diluted bleach solution will kill mold but could also kill the plants on the ground below, so be careful to spray just enough to soak the mold itself. Specific roof cleaners containing fungicide are also available. Installing zinc strips at the peak of the roof can help keep mold at bay.

USE A GENTLER DRAIN CLEANER

Frequent use of some chemical drain cleaners can soften plastic drainpipes and corrode metal ones. Go easy on your pipes by using a drain cleaner made of natural enzymes that eat away at grease, oil and soap blockages. This type of drain cleaner isn't nearly as aggressive as traditional cleaners and is best used as a preventive. Use it when you first notice the slow draining. Home Solv is one brand and costs $6 online.

MYTH: It's OK to pour grease down the drain while running hot water.
FACT: Sure, the hot water will keep the grease from hardening ... until it cools off farther down your drain lines. That just makes the clog harder to clear. Never pour grease down your drain!

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **HSP**

RINSE YOUR SPREADER

Chemicals from fertilizers speed up corrosion of the metal parts of your spreader, so rinse it out every time you use it. After it dries, coat all the moving parts with a light lubricant spray like WD-40.

STORE PAINT CANS UPSIDE DOWN

When a paint can is stored upside down, the paint creates an absolutely airtight seal, which will make the paint last longer. The obvious caveat to this tip is to make sure the lids are sealed tightly.

LUBRICATE BITS AND BLADES

We use Boelube at Lockheed Martin to make our drill bits last longer. Whenever I drill multiple holes in metal, I stick the bit into the lube before starting each one. It also works on metal-cutting reciprocating and band saw blades. It reduces friction, which makes the cutting edge last longer. And yes, it was developed by our competitor, the Boeing Company. The product number is 70200-13, and you can find it at mscdirect.com and other online retailers for about $5.

Mike Pado is a Field Editor and a manufacturing engineer. He lives in Atlanta.

VACUUM YOUR CARPET OFTEN

On carpet, dirt acts like thousands of little blades. Walking across a dirty carpet grinds sharp dirt particles against the yarn, making tiny nicks in the fibers. That dulls the sheen, which is why high-traffic areas appear duller than the rest of the carpet. Over time, grinding dirt will actually wear away the fibers themselves.

Bottom line: The less dirt in your carpet, the longer it will last. A good rule of thumb is to vacuum your carpet once a week. High-traffic areas will require more frequent vacuuming.

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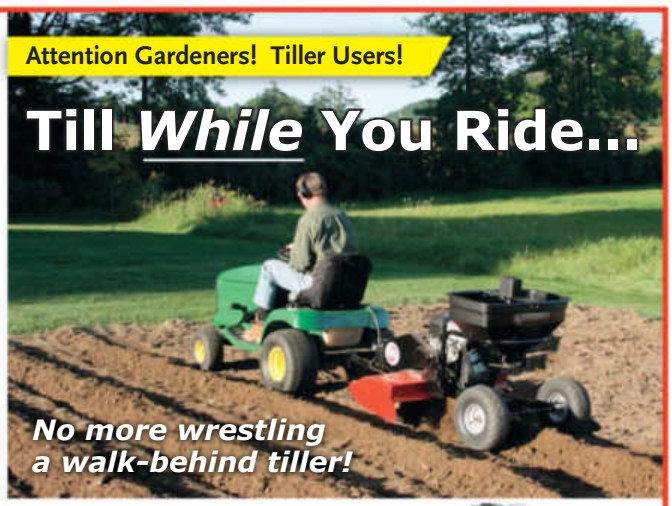

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MYTH: Don't store batteries on a concrete surface.
FACT: According to the folks at Interstate Battery, "Tremendous technological improvements have been made in the seals around the battery posts and vent systems, which have virtually eliminated electrolyte seepage and migration. So, it's OK to set or store your battery on concrete."

KEEP BATTERIES CHARGED

Batteries can deteriorate and die if they go a long time without being charged. Charge the batteries for your boat, motorcycle or riding lawn mower at least once a month in the off-season. Another option is to hook them up to a battery maintainer. A battery maintainer won't damage your battery like a trickle charger would. A maintainer has smart monitoring circuitry that charges the battery only when it needs it. Remove the battery and store it indoors if you live in an area with severely cold winters.

LONG-LASTING CLOTHES

I always wash my clothes inside out. The exterior of the fabric takes much less abuse and everything looks newer longer.

Dana Blouin is a *TFH* Field Editor, technologist and tinkerer of all things. He lives in Westlake, OH.

What homeowners MUST know

BY GARY WENTZ editors@thefamilyhandyman.com

NOT JUST FOR THE KITCHEN

Painters love Glad Press'n Seal self-stick kitchen wrap because it goes on fast and stays put. Line paint trays to eliminate cleanup later or use it to shield any surface.

Fix a dead light fixture

Lots of things can go wrong with a lamp or light fixture, causing bulbs to burn out quickly or flicker or not work at all. Here's the first thing to check: Unscrew the bulb and peer into the socket. The little contact tab in the center of the socket should be tilting slightly outward, away from the bottom of the socket. But sometimes the tab gets bent flat against the socket so it can't make contact with the base of the lightbulb.

The fix is easy. But before you do anything, unplug the lamp or turn off power to the fixture. Make sure the power is off using a noncontact voltage tester. Then simply bend the tab outward with a small screwdriver.

Vacuum out drain clogs

A wet/dry vacuum can suck clogs out of plugged drains. Even plumbers use this trick sometimes. If you need to increase suction, seal around the nozzle with a wet rag.

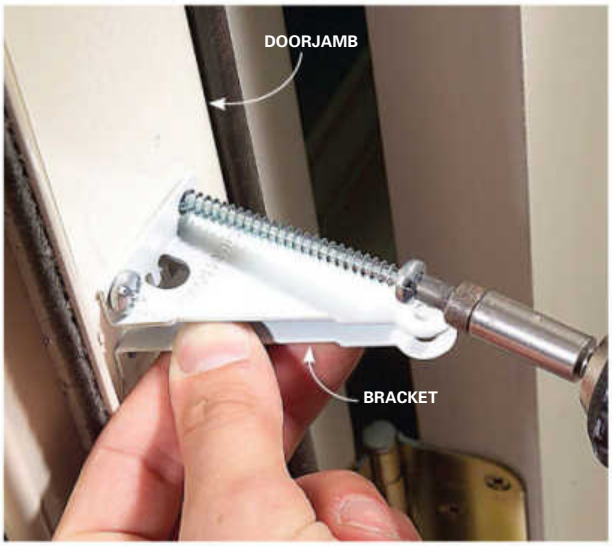
GOT A HOMEOWNER TIP?

Send it to editors@thefamily-handyman.com. If we publish it, you'll get a $100 gift card.

ART DIRECTION **MARY SCHWENDER** • PHOTOGRAPHY **HSP**

THE SIMPLEST FIX FOR STRIPPED SCREWS

There are a bunch of good solutions for stripped screws. But before you glue toothpicks into the hole or fill it with putty, consider the simplest fix: Use a longer or fatter screw.



1 TRY A LONGER SCREW
The screws securing this storm door bracket had stripped. A longer screw—long enough to penetrate the wall framing—solved the problem.

2 TRY A FATTER SCREW
A screw that's slightly thicker than the original will grip firmly in a hole that's been enlarged by a stripped screw.

PHONE SHIELD

When you're painting or gardening, keep your phone clean and dry by sealing it inside a zip-top bag. You can still work the buttons right through the bag.

Heat up stuck tape

A hair dryer softens the adhesive under tape or bumper stickers, making them easy to pull off.

Want more?
100 Things Every Homeowner Must Know **will make you a smarter homeowner (even if you're already pretty smart). Buy your copy today at rdstore.com/Homeowner and enter promo code 100TEHMK for free shipping. Also available wherever books are sold.**

BY JEFF GORTON editors@thefamilyhandyman.com

Master metal conduit

Running electrical conduit on the surface of a wall is an easy way to add wiring to a workshop, garage or basement or anywhere else there are no open stud cavities. And electrical metallic tubing (EMT) is a perfect choice. It's strong, cheap and easy to bend once you learn how. After the conduit and boxes are mounted, you push or pull wires into them, and connect the wires to the switches, outlets, lights or other devices you're installing.

Custom-bending conduit is a bit of an art that takes some practice. And you'll need a conduit bender ($30) to pull it off. We won't cover that in this story, but the instructions included with the bender will help you. We'll also show you alternatives to bending, along with more great tips for working with conduit.

Advance Release:

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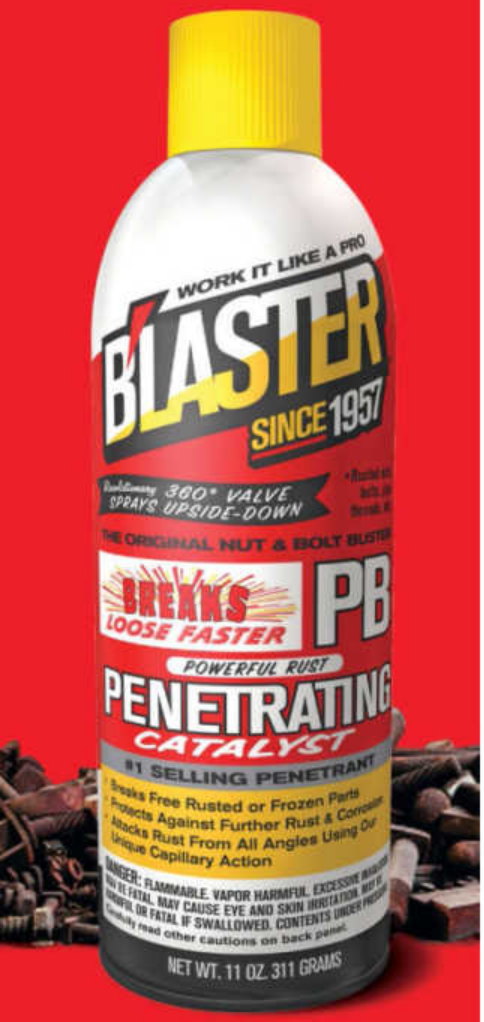

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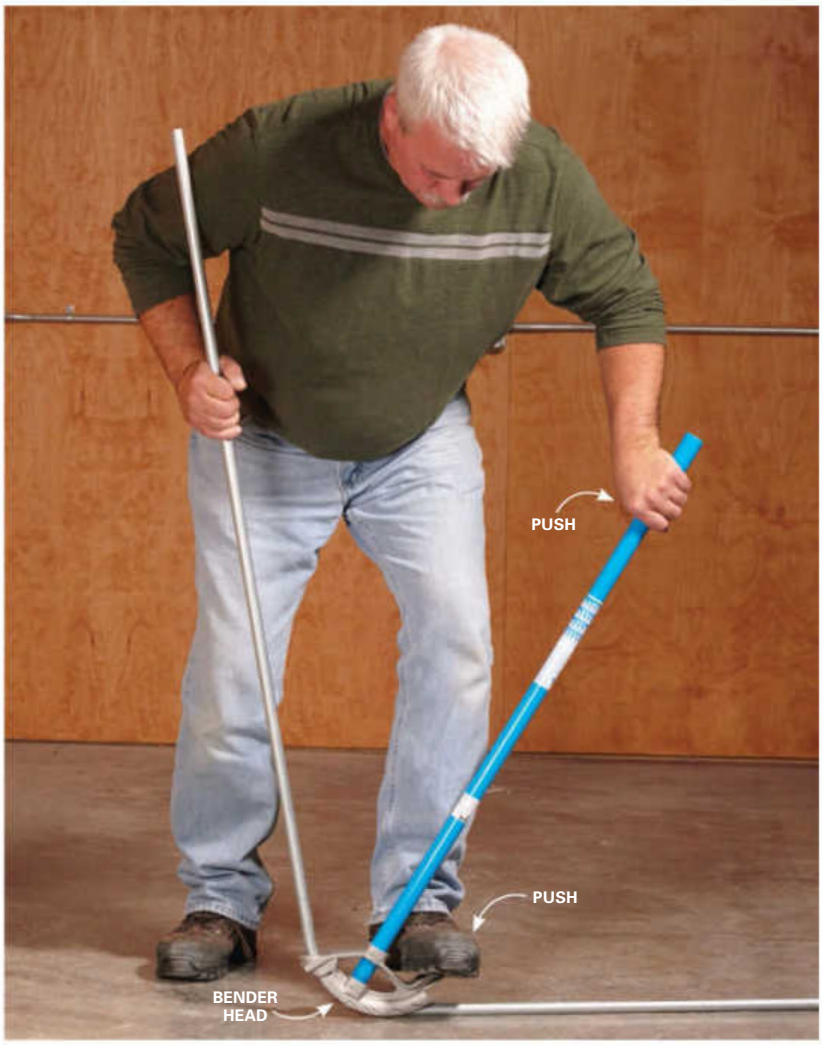
1 Don't want to bend conduit? Use fittings instead

They may cost a little more and look a bit less professional, but if you have just a few bends to make and don't want to buy a bender and learn how to use it, you can use fittings instead. You can turn inside corners and change direction with pre-bent 90- and 45-degree angles connected to straight sections of EMT with couplings. Buy pulling ells to avoid bending the conduit around outside corners. You can also use offset connectors instead of making an offset bend where EMT connects to boxes.



ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA**

2 Use your foot

It's obvious that you have to pull and then push on the handle of the bender to bend the conduit. But you also have to step on the footpad. While pulling or pushing the handle, put equal pressure downward on the bender head with your foot. This prevents the bender from creeping along the conduit and resulting in a bend that's too long. By the way, bender heads are diameter-specific. Match the bender to the diameter of the EMT you're using.

3 Clamp conduit for easy cutting

A large slip-joint pliers is all you need to hold conduit firmly in place while you cut it. Clamp the conduit to a workbench, sawhorse or even a wooden ladder step with the pliers. Then mount a sharp, 32-tooth-per-inch hacksaw blade in your hacksaw frame and cut the conduit. After you make the cut, it's important to remove any metal burrs from inside and outside the conduit. Insert the blade of a screwdriver into the conduit and swivel it around to flatten any burrs on the inside of the pipe. Twist the jaws of the slip-joint pliers around the outside of the conduit to remove burrs there.

4 Avoid offsets with conduit hangers

Conduit should be supported within 3 ft. of a box, with additional attachments no more than 10 ft. apart. One method is to clamp the conduit tight to the wall with single-hole conduit straps. But if you do this, you'll have to either bend an offset in the conduit or use an offset fitting where the conduit enters boxes. You can avoid offsets by attaching the conduit with conduit hangers. These hangers hold the conduit off the wall so it can run straight into boxes with no offset.

To install conduit hangers, hold the conduit against the wall where you want it and make a mark on the top and bottom where the hanger will go. Remove the conduit, center the strap between the marks and attach it with a screw. It's best to locate the hangers over framing for a solid attachment, but if you can't, use a drywall anchor instead. Now simply slip the conduit into the hanger and secure it with the included bolt and nut.

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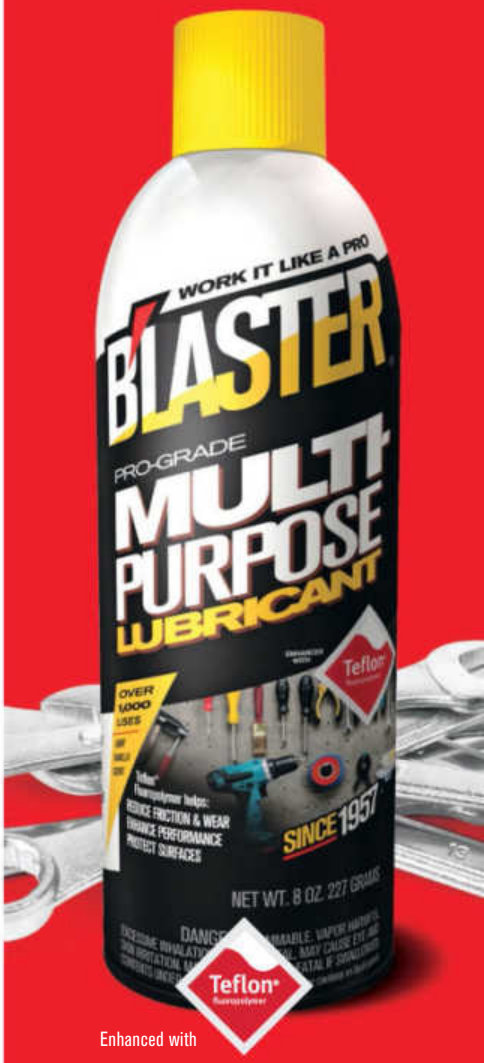

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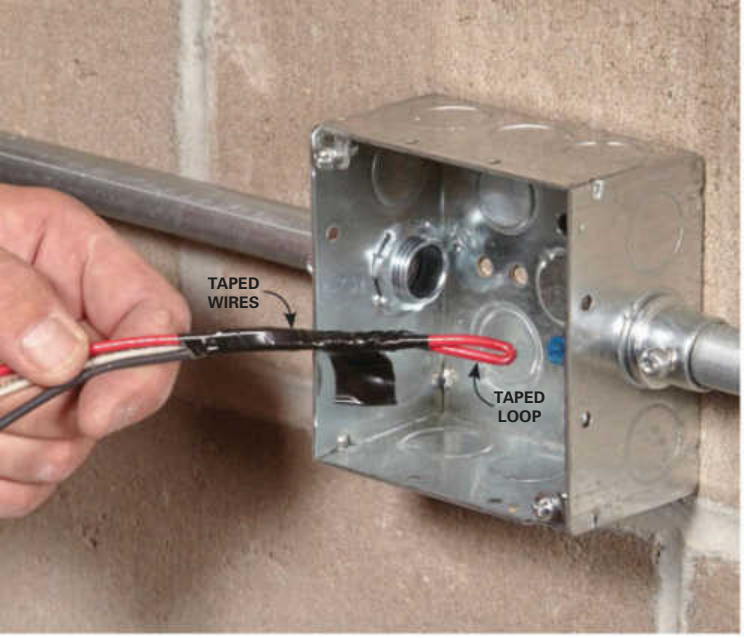
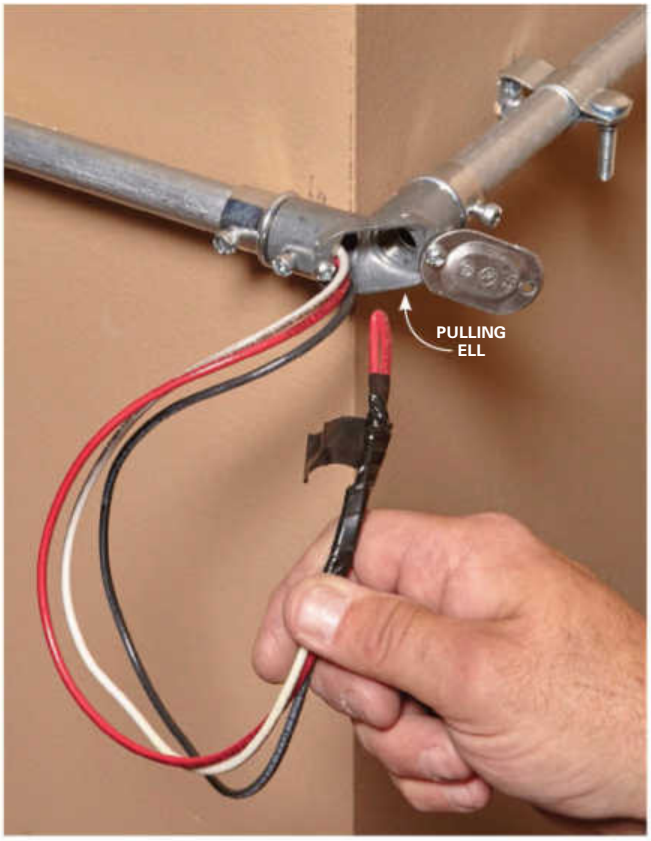


5 Save time—push rather than pull wire

One method of getting wire from one box to the other is to insert a fish tape into the conduit on one end, push it through to the other end, hook the wires to it and pull them back through. But with the right technique, you can often simply push the wires through the conduit, especially if there aren't too many bends and you're using solid rather than stranded wire.

To do this, first choose one wire for the leader and make a bend on the end. Then use electrical tape to attach the remaining wires to the lead wire. Starting at the open end of the loop, wrap the tape tightly around the wires to make sure they stay attached. When you reach the end, cut the tape and fold it back on itself to make a tab. This makes it easier to remove the tape. Then simply push the bundle of wires through the conduit. The bent end of the lead wire will prevent it from getting hung up on fittings.



6 Use a pulling ell at outside corners

You can't just go around an outside corner with a 90-degree bend or fitting, because the wide radius would cause the conduit to stick out into the room. You can bend conduit to go around an outside corner, but it requires two bends and is a little tricky. A 90-degree pulling ell provides the easiest solution. To use it, you remove the cover and push or pull the wires to the bend. Then bend the wires around the corner and push or pull them to their destination. The last step is to coax the wires into the fitting. Have a helper gently pull one wire at a time while you work it into the ell. When all the wires are neatly tucked into the pulling ell, replace the cover.

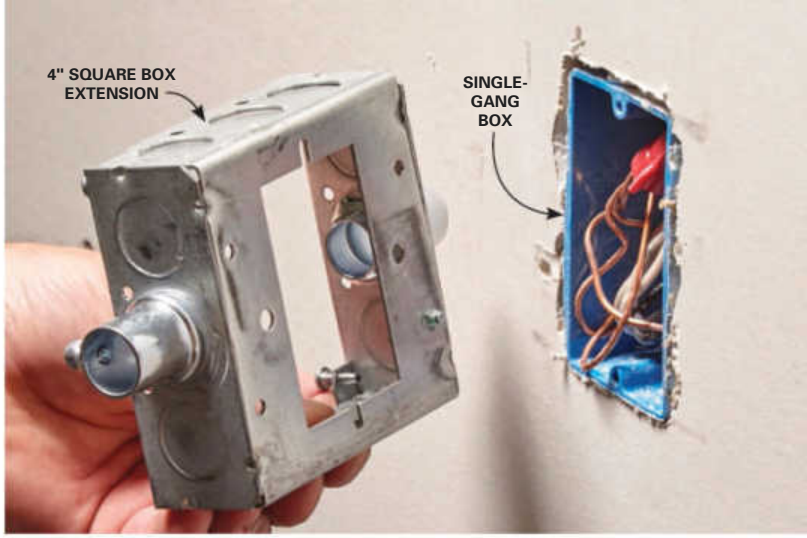
7 Tighten box connectors easily

To maintain a good ground and provide a solid attachment, EMT is connected to metal boxes with fittings called conduit connectors. After you've removed one of the knockouts from the metal box, you insert the connector into the hole and thread on the retaining nut. To achieve a good ground connection, it's important to make sure the nut is really tight.

Here's an easy method to tighten the nut. Before you mount the box, thread the nut onto the connector and hand-tighten it. Then position the connector so that the setscrew is a quarter turn counterclockwise from the front of the box. Grab the connector with a pair of pliers and twist it a quarter turn to tighten it. With this method, the nuts will be tight and all of the setscrews will be facing out.

8 Tweak bends with the bender handle

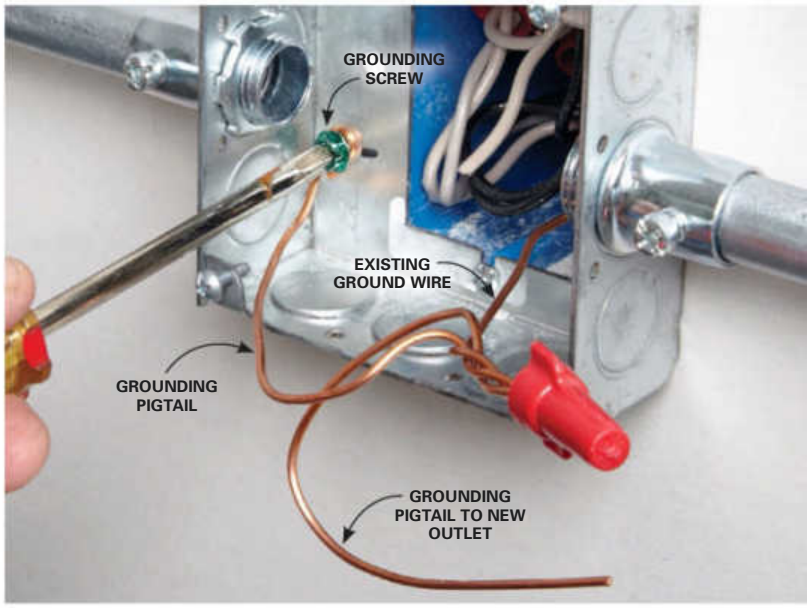
If your conduit bend isn't quite right, an easy way to adjust it is to slide the handle of the bender over the conduit and bend it a little one way or the other. And here's how to know if your 90-degree bend is really 90 degrees. After bending the conduit, place one leg of the bend vertically against the wall and the other leg on the floor. If the vertical leg is parallel to the wall, the bend is 90 degrees. If it's away from the wall at either the top or the bottom, use the conduit handle to fix the problem.



9 Use a big box extender

If you're planning to run conduit on a finished wall and use an existing electrical box for power, you'll need to start by adding a box extension. If the existing box is a single-gang box, you could use a single-gang box extender. But a much better method is to add a 4-in. square box extender with a single-gang cutout in the back. The larger box extender gives you more room to easily connect wires and add devices. It also looks better because it covers up any ragged edges of drywall around the single-gang box, and it will match the other 4-in. square boxes you'll be installing for the rest of the system.

The only drawback to this tip is that these boxes can be difficult to find. You may have to order one online or go to an electrical parts supplier rather than the local home center.



10 Remember to ground the conduit

In an EMT wiring system, the metal conduit functions as the ground. You don't need a separate ground wire. But you do need to make sure the conduit itself is securely connected to a known ground.

In the example shown here, the metal box extension is connected to a plastic box. Connect the ground wire in the plastic box to the metal box extension by screwing a No. 10-32 grounding screw into the threaded hole in the metal box extension and connecting a short length of copper wire (grounding pigtail) to the screw. Then connect the grounding pigtail to the ground wire or wires in the plastic box with a wire connector. Add grounding pigtails to connect any devices you'll add to the box.

BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Replace struts yourself and save $300

If you've put 80,000 or more miles on your struts, they're worn out and must be replaced (see "How to Tell If You Need New Struts"). We know they're expensive (about $700 for front struts replaced at a shop). But in the long run, driving on worn struts actually costs you more. That's because the unchecked bouncing destroys your tires and quickly wears out other expensive suspension components like ball joints, control arm bushings, stabilizer bar end links and tie rod ends. And worn struts are dangerous because they increase your stopping distance by almost 10 ft. from 60 mph and cause steering instability, especially on curves at higher speeds.

Replacing struts used to be a dangerous job for a DIYer. You had to compress the spring and remove the strut while praying the spring wouldn't let go and take out an eye or a limb. Plus, removing the rusty nut at the top of the strut could turn into a nightmare if the internal hex stripped out. But these days you can buy a complete strut assembly that eliminates the strut/spring/mount disassembly process. These assemblies allow you to replace both of your front struts yourself in less than two hours. You'll have to get an alignment done afterward (about $100), but you'll still save about $300 by doing the job yourself. You'll need rust penetrant, wrenches, a pin punch or large screwdriver, and a thin piece of plywood. You may need to buy a few large sockets and a breaker bar. Here are the steps.

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Shop for struts and tools

Find complete strut assemblies (Quick-Strut by Monroe, Strut-Plus by KYB, and ReadyMount by Gabriel are three brands) at any auto parts store or online auto parts supplier (rockauto.com and autoanything.com are two examples). They're available for most makes and models. Complete strut assemblies cost more than just the strut, but they're a much better option because they allow you to do the job yourself and get all new parts (**Photo 1**). The new spring restores factory ride height and firmness, and the new strut mount and bearing provides smoother turning and quieter operation. The strut assemblies for this 2005 Dodge Grand Caravan cost about $135 each (the strut alone is $70).

The strut-to-steering-knuckle nuts and bolts are fairly large, so you'll need 18mm through 23mm 1/2-in.-drive deep sockets and a beefy 1/2-in.-drive breaker bar and ratchet.

To get the strut and wheel aligned close enough to drive it to the shop for a professional alignment, you'll need an angle gauge. Use a digital or mechanical angle gauge (AccuRemote Digital Electronic Magnetic Angle Gauge Level, $30 at amazon.com, or Johnson Level & Tool model 700 Magnetic Angle Locator, $9 at homedepot.com).

Prep and measure

You'll have to disconnect a few components from the strut. Replace one side at a time and note the position and location of all nuts and bolts as you remove them. Use the other side as a reference.

Raise the vehicle and support it with jack stands. Start by soaking the strut flange nuts and bolts with rust penetrant. Then pop the hood and spray the strut-tower mounting nuts. While they're soaking, measure the camber angle (**Photo 2**) and write it down.

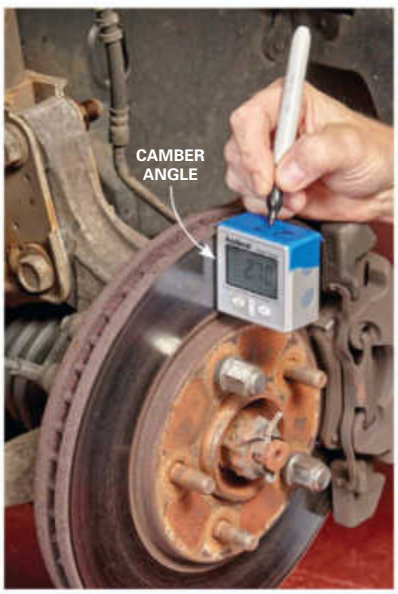
Next, disconnect the stabilizer bar end link (**Photo 3**) and the wheel speed sensor wiring harness and any brake lines that may be secured to the strut.

1 COMPLETE STRUT ASSEMBLIES ARE JUST THAT—COMPLETE
A strut assembly comes assembled and includes all new parts (where applicable): strut, spring, spring seat insulator, strut boot, jounce bumper, strut mount and bearing plate.

HOW TO TELL IF YOU NEED NEW STRUTS

The old "bounce test" for testing shock absorbers doesn't apply to struts—a severely worn strut will pass that test with flying colors. Instead you have to rely on physical inspection and a road test. Always replace struts in pairs, never one at a time. Replace your struts if you notice any of these issues:

- **They're leaking. A very light film of oil near the top of the strut is OK, but fluid leaking down the side of the strut means it's shot.**
- **You notice bounce, sway or front end dive during braking.**
- **It's hard to keep your vehicle in its own lane on bumpy roads and curves.**
- **Your tires show evidence of "cupping"—shallow craters caused by tire bounce.**
- **The strut boot is damaged or the strut body is dented.**



2 MEASURE THE CAMBER ANGLE
Spin two lug nuts onto the studs and tighten to secure the rotor to the hub. Then mount the angle gauge to the top of the rotor and note the angle.

3 DISCONNECT THE END LINK
Hold the stabilizer bar end link with a wrench. Then loosen the nut with a socket and ratchet. Push the end link out of the strut hole and move it to the side. Disconnect the wheel speed sensor wiring harness and put that aside.

Remove the old strut

Loosen the strut flange nuts and bolts and then remove them (**Photo 4**). Next, separate the steering knuckle from the strut (**Photo 5**). Place a thin piece of plywood under the strut flange to prevent it from damaging the CV boot once you disengage the top portion of the strut. Loosen and remove most of the strut mount nuts (**Photo 6**). Then reach into the wheel well to support the strut while you remove the last nut. Lower the strut onto the plywood and let it rest there. Remove the old strut (**Photo 7**).

Install the new strut

Installing the new strut is the reverse of the removal, but it's very tricky and sometimes impossible to get it into place and hold it there while you get the nuts started. So enlist the help of a friend for the actual installation. Once it's in place, torque the strut mount nuts to spec. Then push the steering knuckle into the strut flange and use a pin punch to align one hole so you can insert a bolt. Then remove the punch and insert the other bolt. Snug up the nuts, but don't tighten fully.

Reattach your angle gauge and push the knuckle in or out to come as close as possible to the original camber angle (**Photo 8**). Torque the nuts to spec and recheck the camber angle. Adjust if necessary.

Reinstall the stabilizer bar end link and wheel speed sensor wiring harness or any other components you removed earlier.

Get it professionally aligned ASAP

The angle gauge method shown here is just to get you close to the alignment you had before replacing the struts. But it's no substitute for a real alignment from a pro. Since incorrect camber can cause tire wear, get your vehicle into a shop for a full alignment. We mean the next day, not four months later.

4 LOOSEN AND REMOVE THE NUTS AND BOLTS
Lean in and put some muscle into loosening the strut nuts. Remove them and then loosen the bolts. Push the steering knuckle in and out to wiggle the bolts out of the holes.

5 SEPARATE THE STRUT AND KNUCKLE
Jam a pry bar between the strut and the knuckle and pry the knuckle toward you until it pops out of the strut flange.

6 REMOVE THE STRUT MOUNT NUTS
Use a ratcheting wrench or socket/ratchet to loosen the strut mount nuts located on the strut tower. Loosen all of them and remove all but one.

7 REMOVE THE STRUT
Grab the strut bottom and spring and tilt the bottom out toward you. Then lower the strut until it clears the strut tower and lift it out.

8 RESET THE ANGLE
Attach the angle gauge to the rotor and push the knuckle in or out until you return to the original camber angle. Tighten the nuts.

DIY Quiz

BY TRAVIS LARSON editors@thefamilyhandyman.com

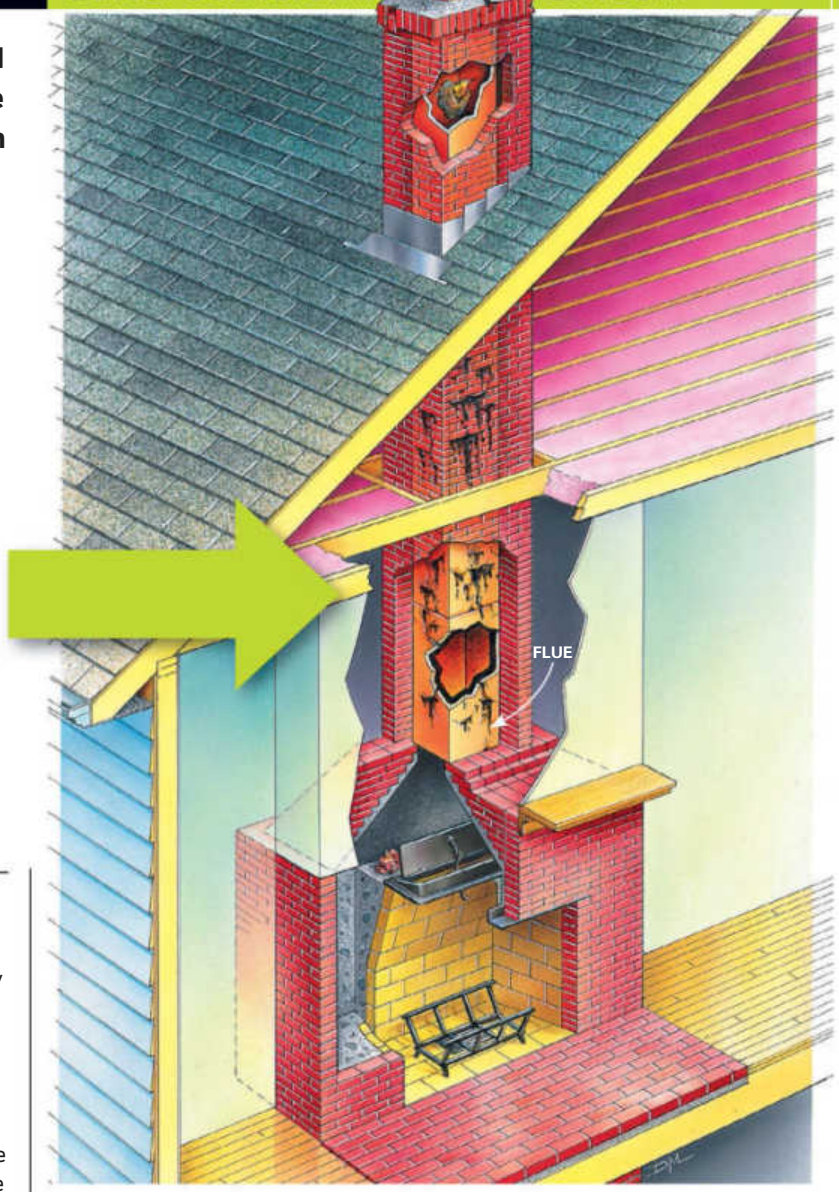
ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY HSP

Put on your thinking cap and take this month's quiz to see just how smart you are when it comes to DIY. Here's how it works:

- There are easy, intermediate and really tough questions all mixed together.
- There may be more than one correct answer!
- The answers begin on p. 76. Get your DIY rating on p. 77. Good luck!

1. When should you clean that fireplace flue?

A. When the "scratch" test indicates a creosote deposit that's 1/8 in. thick or more.
B. A good rule of thumb is to clean after every 50 or so fires.
C. Clean the chimney every fall before fireplace season.
D. If you are careful to burn only dry firewood, you're fine having it swept every three years.



2. How does parking your car in the driveway pose a burglary risk?

A. If you consistently park your car only in the driveway, thieves will know the house is unoccupied if your car is gone.
B. A burglar will break into the car and use the garage door opener to gain access to the house.
C. The bad guys will match your license plate number to your address and have everything they need to commit identity theft.
D. None of the above.

3. How does a snow tire differ from an ordinary tire?

A. Softer rubber; more aggressive tread.
B. Built-in little squeegees to grip the ice.
C. Tiny little "pumps" to suck water off the road and spit it out.
D. All of the above.

4. What in the world are these shelf brackets made from? (No "multiple guess" here—you tell us!)

5. What is this trim called?
A. Quarter round
B. Base shoe
C. Roman ogee
D. Base finish trim

6. True or False? One effective way to deal with ugly, outdated ceramic wall tile is to paint it.

7. What's the point of the blocks under the base?
A. It's a "wet floor" area like a bath or laundry room, and raising the base keeps it dry.
B. It lets more base show over thick carpet.
C. Typically this is done over floors covered with laminate flooring materials. Base shoe is added later to hide the gap.
D. It's a simple way to install perfectly straight base.

8. True or False? When you're taping a crack-prone joint in drywall, go with fiberglass tape, not paper.

9. True or False? The glossier the varnish, the harder the finish.

Find the DIY Quiz answers on pp. 76 and 77.

10. You hit a stopped car at a stoplight but no one is hurt. You should:
A. Immediately admit fault and offer to pay for the damage out of your pocket so neither party has to report the accident to their insurance company.
B. Swap license and insurance information, shoot pictures of the damage with your cell phone and report the accident to your insurance company.
C. Ask the owner to get three repair quotes so you can decide whether to pay for the damage yourself or report it to your insurance company.
D. Call the police so there's a report of the accident.

11. You take your car in for an oil change and the shop recommends a fuel injection and air induction cleaning service and an engine, power steering, and brake fluid flush. You should:
A. OK those services; they will keep your car running longer.
B. Check the manufacturer's maintenance manual (in your glove box) to see if those services are recommended by the carmaker.
C. Reject all the recommendations and stick with just the oil change.
D. OK the injection cleaning and brake fluid flush only. The other two are rip-offs.

12. You're painting a textured popcorn ceiling that's never been painted before. The best technique is:
A. Roll the paint back and forth just as you would with any other wall or ceiling.
B. Roll in one direction only and let the first coat dry. Roll the second coat perpendicular to the first coat to get full coverage.
C. Mask off the walls and floors and rent an airless sprayer to spray the ceiling.
D. Spray and back-roll to force the paint into the gaps around the texture.

13. Which color chalk should you use to mark shingles for cutting—red or blue?

14. What does the "SPF" stamp on lumber mean?
A. Southern Ponderosa Fir
B. Standard Pine Framing
C. Southern Pine Framing
D. Spruce Pine Fir

15. True or False? Frost-proof sill cocks have a life expectancy of 10 years or so. Because they're sealed units, they can't be repaired, so they need to be replaced when they fail.

DIY Quiz Answers

1. (**A**) Scratch the black surface above the damper (smoke chamber). If the creosote deposits are 1/8 in. thick, schedule a cleaning. If they're 1/4 in. or thicker, don't use your fireplace until you get your chimney cleaned.

2. (**B**) It's very common for a thief to break into a car and grab the always-available remote for the overhead garage door opener. Never leave them in cars parked outside your house overnight.

3. (**D**) Winter tires have softer rubber and more sipes (cuts in the tread) than all-season tires to squeegee more water off the road. The "micro pump" holes in the tread act like plungers to suck water off the road and then spit it out as the tire rolls.

4. These shelf brackets are made from steel studs with Vs cut out and folded into triangles. The corners are reinforced with steel framing screws. To learn about framing with steel, search for "steel studs" at family-handyman.com.

5. (**B**) Base shoe. It's similar to quarter round except that it's 3/4 in. tall and 1/2 in. wide. It's generally only used over hard-surface floors like tile or hardwood to contour along floor irregularities and hide any gaps between the base and the floor.

6. True. Ceramic tile is paintable as long as it's thoroughly cleaned, sanded with 180-grit paper and sized with a bonding primer. Then you can paint it with epoxy paint that's made for tile. Rust-Oleum Tub & Tile paint is one example. You'll have the best results on non-wear surfaces like tiled bathroom walls. Forget about painting tile floors or countertops.

7. (**B**) Why hide up to half of that pretty baseboard behind padding and carpet? Plus, the carpet installers like to tuck the carpet into the gap during installation for a tidy, cleaner look.

8. False. Surprisingly, mesh tape doesn't have nearly the strength of paper tape. If you're taping walls that are prone to cracks like those

exposed to low temperatures or vibration, you should use paper tape. If you're repairing walls *because* of cracks in joints, also use paper tape.

9. False. There is actually very little, if any, difference in hardness between various sheens. Choose the sheen you prefer, and if you want more durability, add more coats.

10. (**B**) **&** (**D**). Your policy requires you to notify your insurance company of any accident even if you pay out of pocket, because it incurs liability the instant you hit somebody. If the other party claims injury down the road and you haven't reported the accident to your insurer, it can deny the claim and cancel your policy. Plus, the insurance company will protect you if the other party presents an outrageous repair estimate.

11. (**B**) Perform only the services listed in the car's maintenance guide, not the additional recommendations of the oil change shop. Most carmakers have issued service bulletins warning against routine injector and air induction cleaning unless the car is having a specific fuel- or air-related problem. Engine flushing is never recommended by any carmaker.

12. (**B**) **or** (**C**). Rolling back and forth can wet the texture so much that it peels off onto the roller. Then you'll have to scrape, sand and retexture

the entire room. Rolling in one direction and letting it dry before the second step locks the texture in place but turns it into a two-day project. Spraying is the fastest and the least likely to damage the texture. But it takes a lot more prep work.

13. Blue. Never use a red chalk line for making what you hope are temporary markings on anything that will be visible after the job is complete. Red chalk can stay visible for years, even on exposed masonry.

14. (**D**) SPF stands for "Spruce, Pine, Fir" and means that the lumber you're looking at can be any of the three types. They are the three most common wood types for construction lumber.

WHAT'S YOUR LEVEL OF EXPERTISE?

Beginner: 0 – 5 correct
Intermediate: 6 – 12 correct
DIY Guru: 13 – 15 correct

15. False. Frost-proof sill cocks can last for a very long time and are very easy to dismantle and clean. You can replace the rubber washer and use plumber's grease to lubricate the moving parts so they'll operate smoothly and squeak-free. You can even repair a leaky vacuum breaker.

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AIR TOOL STATION

A 2-1/2-gallon bucket is all you need to store air tools and hoses on a wall right by the air compressor. Screw a 3/4-in. plywood shelf inside the bucket to create two storage areas, then attach the bucket to the wall with a couple of screws and washers. Load up the bucket with nailers, nails, tire pressure gauges and other accessories and coil the hose around it.

Pie plate pockets

Screw cut-in-half pie tins and heavy-duty paper plates to a shop wall and you've got space-saving storage for the sanding discs, circular saw blades and abrasive discs that like to hide in a drawer. Be sure to tape the sharp edges on the cut pie tins to protect your fingers!

DRILL HANGOUT

Those big hooks that are often used to hang bikes also make slick drill hangers. Get them at any home center for a couple of bucks apiece.

EDITOR **GARY WENTZ** • ART DIRECTION **MARY SCHWENDER** • PHOTOGRAPHY **HSP**

SEALED AND STORED

Here's a slick tip to keep partially used caulk tubes well sealed and at hand. Fold a piece of duct tape over the open tube to seal it, leaving a few inches of extra tape. Drive a nail through the tape and hang the tube on pegboard.

10-second hammer rack

To hang a hammer, all you really need is a protruding screw. The hammer's claw grabs the screw threads and stays put.

String dispensers

Here's a great way to reuse empty CD containers. Drill a hole in the top for the string to slide through, then screw the lid under a shelf and snap on the string-loaded container. Pull down and snip off the desired length and never worry that your ball of string will roll away across the floor dragging its tail behind it!

SPRING CLAMP ROOST

Spring clamps are convenient to use—but inconvenient to store. The solution is a cheap towel bar. Some cost as little as $5.

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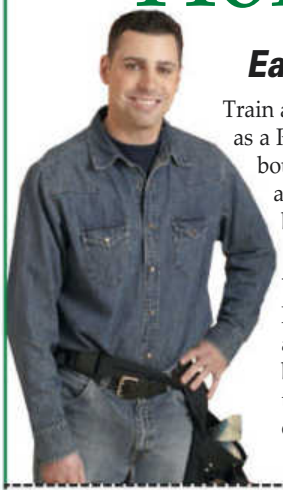

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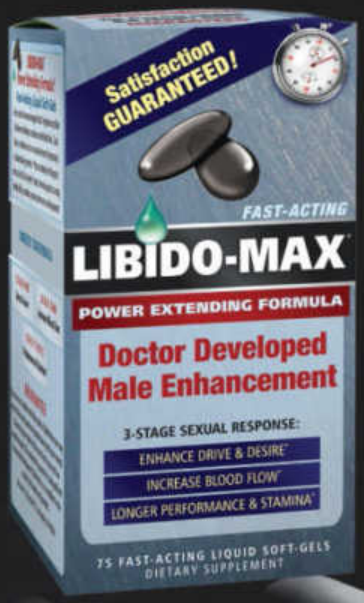

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PRO talk

BY MARK PETERSEN editors@thefamilyhandyman.com

JOSH RISBERG

Wheelbarrow topper

The slanted shape of a wheelbarrow makes it perfect for moving dirt and concrete, but square items like toolboxes—not so much. As a lead carpenter for a remodeling firm, I was constantly hauling tools back and forth from my truck to the job site, twice a day, every day. On a whim, I built a box to sit on top of my wheelbarrow so I could haul more tools at once. I liked it so much that I took it to the next job, and the one after that, and the one after that. It's just a simple plywood box with cleats fastened to the bottom to keep it from slipping off the wheelbarrow. I've hauled mountains of stuff with it over the years.

Josh Risberg, Lead Carpenter

Carry short cords with tools

I love short extension cords. I keep one in the boxes of my most-used tools, like my circular saw and Sawzall. The short cords don't reach the nearest outlet every time, but often enough to justify taking up space in the box. I make sure to buy 14-gauge, and I prefer the ones that have a couple extra receptacles, like this 9-footer here.

Chris Petersen, Contractor

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Check vents and flashing

As a longtime plumber, I always try to investigate as many possible causes as I can before leaving a job, even when it seems there's an obvious culprit. Most often, a wet, swollen bathroom floor right under a toilet is caused by a leak or failing seal. But that's not always the case.

On this job, the cap was missing on the plumbing stack flashing, a problem that wasn't visible from the street. Only by pulling out my ladder did I discover the real reason for the wet floor. Nobody likes crawling around on a roof, but old, damaged or poorly installed roof flashing causes many leaks. This homeowner was thrilled that I didn't just slap on a new wax ring and hit the road.

Les Zell, Master Plumber

LES ZELL

How a Chicago Doctor Shook Up the Hearing Aid Industry with his Newest Invention

New nearly invisible digital hearing aid breaks price barrier in affordability

Reported by J. Page

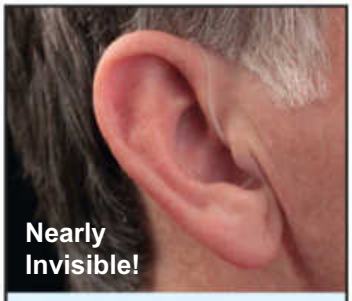
Chicago: Board-certified Ear, Nose, and Throat physician Dr. S. Cherukuri has done it once again with his newest invention of a medical-grade, ALL-DIGITAL, affordable hearing aid.

This new digital hearing aid is packed with all the features of $3,500 competitors at a mere fraction of the cost. **Now, most people with hearing loss are able to enjoy crystal clear, natural sound—in a crowd, on the phone, in the wind—without suffering through "whistling" and annoying background noise.**

Digital Hearing Aid Outperforms Expensive Competitors

This sleek, fully programmed, light-weight, hearing aid is the outgrowth of the digital revolution that is changing our world. While demand for "all things digital" caused most prices to plunge (consider DVD players and computers, which originally sold for thousands of dollars and today can be purchased for less), the cost of a digital medical-grade hearing aid remains out of reach.

Dr. Cherukuri knew that many of his patients would benefit but couldn't afford the expense for these new digital hearing aids. Generally they are *not* covered by Medicare and most private health insurance plans.



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FROM OUR READERS greatgoofs@thefamilyhandyman.com

GREAT BALLS OF FIRE

My shop vacuum was making a grinding noise. I took it apart and blew out all the dirt and grit. But after putting it back together and starting it up, it was still noisy. I decided to try lubricating the motor with a few squirts of WD-40. This time, however, I heard more than just a grinding noise. There was a "kaboom" accompanied by a big, blue ball of fire shooting out of the motor. What I didn't consider is that WD-40 is flammable and that electric motors generate sparks. Not a good combo, as my singed eyebrows will attest.

Charles Potter

Ramped-up romance

My college girlfriend and I were on the skids. So when her new car was ready for its first oil change, I saw my chance to show that I was both a gentleman and a handyman. I brought my car ramps over to her place and inched up the ramps carefully. But not carefully enough. Clunk! The wheels rolled right off the ends of the ramps and the car was stuck there like a beached whale. Needless to say, this did not rekindle our romance.

Kenneth Power

Flipped my lid

I had just finished painting some cabinet doors and had put them in the garage to dry. Next on my to-do list was to touch up some yellow paint in the living room. When I was done, I took the can of paint back into the garage and used a rubber mallet to hammer the lid back on. Big mistake! Yellow paint from the rim of the can splattered all over the place including right onto the cabinet doors that I'd just painted. Lesson learned: Next time I'll put a rag over the top of the can before pounding the lid back on.

Nora Novak

EDITOR **JASON WHITE** • ART DIRECTION **MARY SCHWENDER** • ILLUSTRATIONS **STEVE BJÖRKMAN**

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